

NOVA NOTES

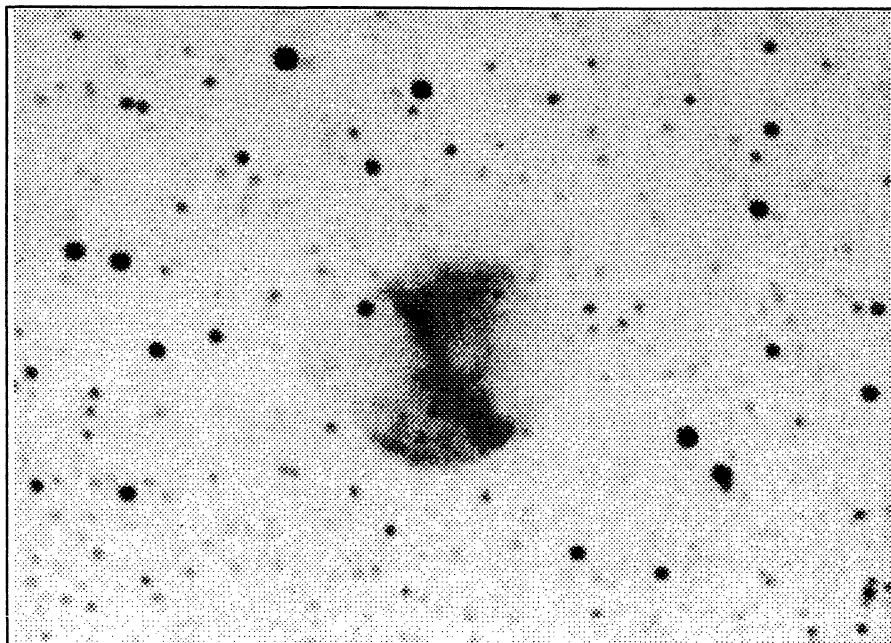
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THE NEWSLETTER OF THE HALIFAX CENTRE OF THE RASC
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NOVA NOTES, the newsletter of the *Halifax Centre of the Royal Astronomical Society of Canada*, is published bi-monthly in February, April, June, August, October, and December. The opinions expressed herein are not necessarily those of the *Halifax Centre*. Material for the next issue should reach the editor by **September 10, 1993**. Articles on any aspect of astronomy will be considered for publication. "Letters to the Editor" or to our resident expert: *GAZER* are also most welcome. The editor can be reached at:

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"Astrophoto of the Month"

M27 - The Dumbbell Nebula

The photograph was taken by Greg Palman of Maine with an Astro-Physics 6" f/8 refracting telescope.

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Editor's Report

Well, the GA is over, and as the registrar, I would like to thank all those who helped out in any way.

Because of GA burnout and other commitments, it has taken me an extra few weeks to get this issue out to the printer. The "in box" has been quite empty, so I haven't felt too guilty about it. But, as usual Joe Yurchesyn, my most prolific Journalist, has come up with a few items of interest.

His article on the business side of the GA covers it well, but let's have someone else write an article about the social and other activities for the next issue. Any volunteers? Ω

The 1993 General Assembly

National Representative Report
by Joe Yurchesyn

The National Council Meeting

All in all, I think that the 1993 GA was very successful - even if my organizational involvement leaves me with a somewhat biased view. I am drafting this report on July 5th while events are still fresh in my mind.

The final tally of the financial situation will not be complete until late August. I will be reporting this to the Centre in a separate report, so for the moment, I'm wearing only my "National Representative" hat.

To save you the monotony of the boring details, as well as wear and tear



Nova Notes is printed on recycled paper

on my single typing finger, I'll ignore most of the housekeeping items and only address items that would be of interest to the average member or otherwise of significant importance. Reports submitted to Council from the various committees are available to any interested member and I will have them available at the September meeting.

The Treasurer's report to Council requested a \$4.00 regular membership fee increase (to \$36.00), to be voted on at the Annual Meeting. This was motivated primarily by the current use of interest income to offset operating costs - which is representative of a potentially unhealthy financial state. It is also due to increasing travel costs - which seem to have grown disproportionately, especially over the last 5 years or so. In addition, to the fee increase, efforts will be taken to better control and perhaps reduce travel and other costs.

Cathy Hall motioned that for future fee increases, two budgets should be prepared, one reflecting the effect of the proposed fee increase and the other assuming no fee increase. After much discussion, the result as I perceived it, is that the finance committee must table a budget that demonstrates a deficit situation with the existing fee structure, before a balanced budget using increased membership fees will be considered.

The 1994 Observer's Handbook will have a retail price of \$17.00 (GST included). A press run of 13,000 copies has been ordered.

The new revised Beginner's Observing Guide will have a press run of 2,750 copies. They will be ready by late July. Promotional material will be available by Labour Day.

The 1993 RASC Calendars sold 800 out of 1,000 producing \$3,000 profit. There will be 1,300 1994 calendars printed. Centre pricing will range from \$3.50 to \$5.00/copy depending on the number purchased. The suggested retail price will be \$10.00 (including GST).



Another photograph from the Hubble telescope

A Speaker Travel Assistance Program was implemented, whereby a Centre can apply for travel assistance for a visiting speaker.

Halifax Centre member Dr. David Turner was appointed as the new Editor of the *Journal*. He will begin his duties early in 1994.

The Membership Survey has been transcribed into computer form and has been made available on IBM disk.

The Light Pollution Committee reported that Banff has changed the lighting on its main street to full cutoff fixtures.

An invitation from the Windsor Centre, to host the 1995 GA, was accepted.

The books of the 1991 Solar Eclipse Expedition have been closed with a profit of \$8,626.74. The committee has been disbanded.

At this point, the National Council meeting was adjourned and was reconvened after the Annual Meeting. David Tindall, who completed his term as National Secretary, was replaced by Randall Brooks, who despite his Ottawa domicile, continues to have his membership attached to the Halifax Centre.

All committee members were reviewed and appointed, including the new Membership and Promotions Committee. The only significant changes are the replacement of Randall Brooks and Randy Atwood from the finance committee by Rajiv Gupta (Vancouver) and yours truly.

National Representative travel costs will be capped at \$1,600/meeting for all attending National Representatives. These fees will only be paid if the Centre does not have any other representative on National Council. What this truly means in practice is not completely clear.

Pat Kelly proposed a standard form which all Centres are to use to report their financial status for publication in the Annual Report. It was accepted and will provide more detail in membership fees (including surcharges) and sales than was available in the past.

Damien Lemay indicated that an insurance agent member in the Quebec Centre felt that the Society's insurance contract may not cover its members as fully as was thought. This will be investigated.

Peter Broughton's has written a book about the "History of the RASC". The plan is for the Society to purchase 1,000 copies from the publisher. Only if sales are poor, does the Society stand to lose any money.

The Annual Meeting

The Annual Meeting began with an acknowledgment of members from each Centre. Only a few Centres were not represented. In my opinion, the Halifax Centre turnout was a disappointing 30-35 attendees; less than the turnout to a regular meeting! (Come on You Guys! Where were you? It is, after all, your Society!)

The Annual Meeting consisted of committee reports (which had also been presented at the National Council meeting), votes on five By-Law amendments, election of a new National Secretary, election of a auditor, and a vote on higher membership fees for 1994.

Proxy voting was used in some of the items to be voted on. An explanation of the proxy voting procedure is given in a separate article in this issue of *Nova Notes*. Of the approximately 140 proxies received, 2 were found to be invalid, and Dr. Roy Bishop was appointed by the Executive Committee to hold all but the 27 Montreal Centre proxies (see below).

The first By-Law amendment required 60 days notice to the National Secretary for a resolution to change fees. The intention of this By-Law amendment was to prevent a radical change in fees (up or down) without adequate notice to the general membership by the comparatively small number of members participating at an Annual Meeting (in person or by proxy). Passage required a 2/3's majority; it passed with a vote of (including proxies) 161 FOR, 43 AGAINST.

The second By-Law amendment deletes the category of Senior membership. Passage required a 2/3's majority; it passed with a vote of 142 FOR, 47 AGAINST.

The third By-Law amendment, to establish the Membership and Promotion Committee, was carried.

The fourth By-Law amendment, to change the wording of the By-Law relating to Proxies was carried.

The fifth By-Law amendment, to not guarantee Society publications to members who pay fees between January 31st and July 31st was carried with a small clarification amendment.

The election of Randall Brooks to the Office of National Secretary was carried.

The election of C. J. Tinkham & Associates as Auditor of the Society was carried.

The proposed Membership Fee increase took on a less lively debate than was expected. Passage required only a simple majority. The vote (including proxies) was 169 FOR, 104 AGAINST, for 61.5%. The new Membership Fee is \$36.00 Regular, 22.50 Youth, and \$900.00 Life.

There were two controversial proxy voting issues this year. The first concerned 27 proxies from the Montreal Centre. Of these, 22 proxies named Suzanne Moreau (Montreal Centre) as proxy holder, 1 named Cathy Hall (Ottawa Centre), and 4 named no one. Suzanne Moreau could not attend, and sent a letter to Cathy Hall, along with her own proxy, naming Cathy Hall as the holder of her proxy and strongly requested that she hold the other 26 Montreal proxies as well. This letter was given to the

Executive Committee along with the Montreal proxies.

Legally, these are valid proxies, with the first proxy holder being Cathy Hall for 1, Suzanne Moreau for 24 and the Executive Committee appointee for 4. Suzanne Moreau's letter is irrelevant. As a diplomatic gesture and to ensure that the intent of the original proxy issuers was carried out, the Executive Committee decided to name Cathy Hall as its appointee for all 27 Montreal Centre proxies, while Dr. Roy Bishop was the appointee for all other proxies.

The second issue concerned proxy holders not casting some proxy votes. This seemed to be a surprise to those members who did not attend the proxy holders meeting prior to the Annual Meeting. To these members, I can only offer the proxy voting explanation and suggest they carefully read their proxy form.

I would suggest that, in future, proxy issuers choose their proxy holders carefully, and that potential proxy holders uncomfortable with directed votes, choose to accept only discretionary proxies.

Well,... what a great GA! Now, where's, my pillow?... I need a rest. Ω

Proxy Voting at an Annual Meeting: by Joe Yurchesyn

Throughout this article I wish to set down in writing my understanding of the facts about the proxy situation at the 93 GA, as explained by Mike Watson (2nd National VP) at the Proxy Holders meeting (held prior to the Annual Meeting). At the very least, it will serve as a benchmark reference for future discussion and should help to put much of the post GA hearsay discussion into perspective.

In reference to Proxy Voting, Canadian Law dictates very little; so each organization is more or less free to make its own rules. The RASC proxy simply names a member to vote on another member's behalf. Legally, the proxy holder is only given the right to vote on behalf of the proxy issuer

and is not obligated to cast that vote. Also, multiple proxies are not cast as a block; each proxy vote is treated as an individual vote, which the proxy holder may choose to cast or not cast.

The proxy issuer must trust that the named proxy holder will actually cast their directed vote or cast their discretionary vote as they would. If after discussion during the meeting in which the proxies are to be used, the proxy holder believes that proxies requiring him to vote one particular way are not in the best interests of the Society, it is within the proxy holder's right to cast those proxies which are in agreement with his opinion, and not cast those which are against it.

Two proxy holders can be named by the proxy issuer, the second being a backup to the first. Unless it is crossed out by the proxy issuer, the standard RASC proxy form allows the Executive Committee to appoint a third backup proxy holder. To be a valid proxy holder, these named people must be eligible to vote at the Annual Meeting. If the voting instructions on the proxy are blank, it is assumed that discretion is intended. To be a valid proxy, it requires a date and signature, and at least one valid proxy holder must be named - either directly or indirectly through the executive committee's appointee. Invalid proxies are discarded.

Prior to the Annual Meeting, all proxies are collected by the National Secretary, determined to be valid or not, counted, and sorted by proxy holder into the categories FOR, AGAINST, and DISCRETION for each item requiring a vote. During the election, votes from the floor are counted first. A request to cast proxy votes may be made before or immediately after the floor vote. For the proxy vote, each first named proxy holder (if there is one) is called upon. The number of proxy votes in each category is stated, and he/she is asked how these votes should be cast. If the first named proxy holder is absent at the time his/her name is called, then the second named proxy holder (if there is one) is called upon, and in the absence of that proxy holder, the appointed proxy holder (if permitted

by the proxy issuer) is called upon. If all three proxy holders are absent, then these proxy votes are not cast. Ω

Scheduled Observing Sessions

Club Observing Session

Saturday, Sept. 18 - Dollar Lake Park site
if cloudy on Sunday, Sept. 19

Club Observing Session

Saturday, Oct. 16 - Dollar Lake Park site
if cloudy on Sunday, October 17

For information or for directions to the Dollar Lake site, call Paul Gray (864-2145) or Dave Lane (443-5989)

Maple Grove Astronomy Club Report

by Bob MacConnell

The Maple Grove Astronomy Club of Hebron, Yarmouth County, had an active year, with many of the club members joined by parents and other interested observers. The club met bi-weekly, once an observing session in dark-sky times alternated with meetings at Maple Grove Education Centre to discuss sky maps, do sunspot observing, or work with software such as the Observatory or Voyager.

The night observing sessions were held at Mr. MacConnell's home in South Ohio, Yarmouth County, an excellent dark area for observing. The rings of Saturn and Jupiter's moons proved to be the most awe-inspiring, especially for first time viewers!

Hot chocolate and popcorn raised spirits when fingers started paining. A real star-party atmosphere ensued the eve of the lunar eclipse, with close to twenty hungry observers snacking on pizza between views of the major astronomical event of the year!

During Education Week, which tied in nicely with Astronomy Day, the club telescope was brought to the K-Mart Mall, and scores of fascinated shoppers were treated to views of Jupiter's moons, double stars, and Mars. Ω

Constellation of the Month: Lyra

by Joe Yurchesyn

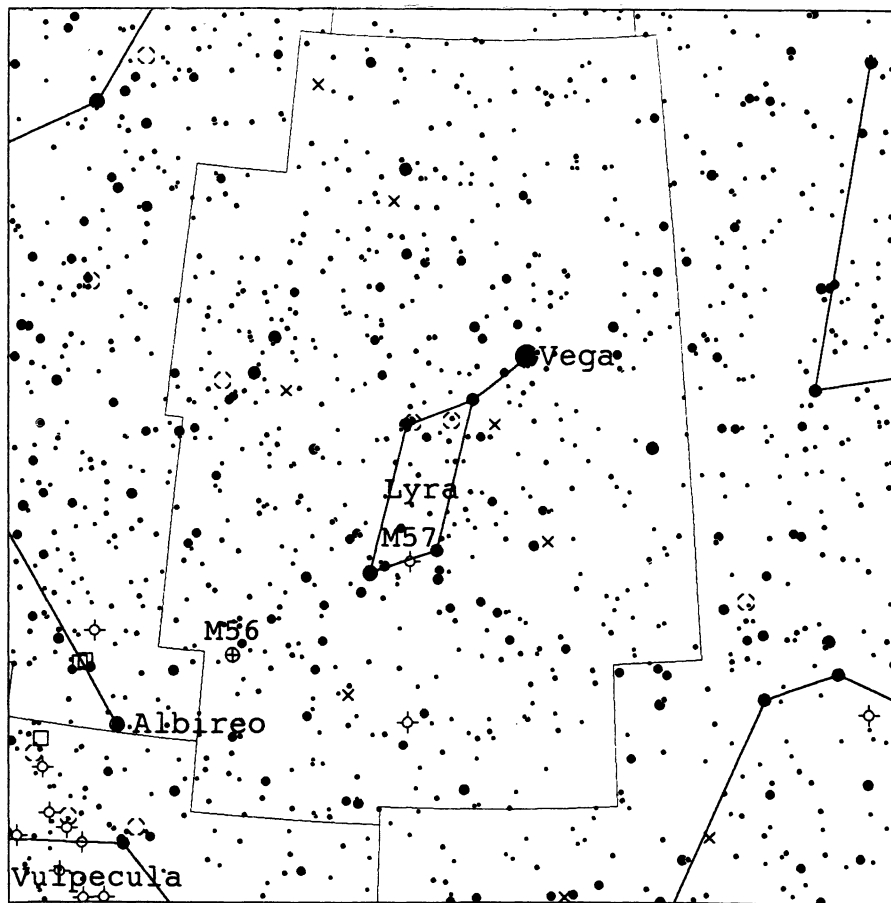
Lyra is a small constellation dominated by one 1st, and 4th magnitude stars in the form of a diamond shaped asterism. Located just west of the summer Milky Way, Lyra is surrounded by Cygnus, Draco, Hercules, and Vulpecula, and Deep Sky objects associated with the plane of the Milky Way, such as star clusters, globulars, nebulae, and planetaries are found here, including two Messier objects (M-56 & M-57). The northerly declination of Lyra means that, for northern observers, it sets in the early evening during early winter and begins to rise in the early evening by late winter; and as such, is visible for most of the year.

The constellation Lyra and its brightest star Vega date back to antiquity. The name Vega is derived from the Arabic *Al Nasr al Waki*, "The Swooping Eagle". Alternate forms of *Waghi*, *Vagieh*, and *Veka* appear on

Medieval charts, with the star and the constellation depicted as an eagle, vulture, or falcon; often bearing a harp or lyre in its beak or talons.

In classical times, it was also referred to as a Tortoise Shell because, according to Greek legend, Hermes created the first harp from an empty tortoise shell. The music of the Lyre cast such a spell that Orpheus charmed every living creature with it, even persuading the grim guardians of the Underworld to allow him to rescue his beautiful wife Eurydice from the Land of the Dead. Having been warned not to glance upon her until they had safely reached the upper world, Orpheus unfortunately lost Eurydice at the last moment by disobeying that fateful order.

Vega also plays a prominent role in the Chinese legend of the "The Herd-Boy and the Weaving-Girl". Vega is the "Weaving-Girl" and Altair and its two attendant stars are the "Herd-Boy". According to the legend, the two young lovers, lost in "amorous dalliance", neglect their duties to Heaven, and become eternally



separated by the Celestial River, the impassable barrier of the Milky Way. However, even in China there is compassion, and once a year, on the seventh night of the seventh moon, the lovers are allowed to meet, when a bridge of birds temporarily spans the River of Stars.

In addition to the mythology, Vega also hides a bit of astronomical trivia. Due to precession, Vega was the pole star 12,000 years ago, and will be once again in 12,000 AD. However, even at its closest approach, it will still be $4\frac{1}{2}^\circ$ away from the celestial pole. Vega was also the first star to be photographed using the Daguerreotype process and the 15" Harvard Observatory refractor. It was on July 16-17, 1850 and the exposure was 100 seconds! In 1963, its diameter was measured with a double mirror array apparatus, and was found to be $0.0037''$ ($\pm 5\%$). Based on a distance of 27 ly's this corresponds to 2.8 million miles, or about 3 sun diameters. Vega also has a mass of 3 suns, and a luminosity of 58 suns.

Lying about $1\frac{1}{2}^\circ$ northeast of Vega is Epsilon Lyrae, the renowned "Double-Double". The main components are easily split with binoculars, but a 3" telescope is needed to observe that each of these stars is itself a double. The pair were first discovered by William Herschel in August 1779. The separation of the northern pair is currently widening, with maximum set to occur around 2100 AD; the period being around 1,165 years. The separation of the southern pair is currently closing, with a minimum set to occur around 2350 AD; the period being around 585 years. All four stars share the same proper motion, and parallax measurements place them 180 ly's

distant. This puts the separation between the two pairs at 13,000 AU (0.2 ly's), implying an orbital period of around 1 million years. No orbital motion for the wide pair has ever been detected, but the radial velocity of one pair is slightly higher than that of the other; so perhaps the orbital motion is being seen edge-on?

At the southwestern corner of the diamond lies Beta Lyrae. It has been described as the most frustratingly interesting object in the sky for the astrophysicist. It is a multiple star system with variable light output, which can, at best, be described as having a complicated mass transfer process.

The globular cluster M-56 is located in the southeastern part of the constellation, less than midway between Beta Cygni and Gamma Lyrae. The lack of prominent guide stars and the presence of the Milky Way makes it a little difficult to locate. It was discovered by Charles Messier on January 19, 1779, the same night he discovered one of his comets. A lack of motion demonstrated its non-cometary nature, and it was then added to his list. In 1784, William Herschel was able to resolve the object into a mass of 11^{th} to 14^{th} magnitude stars. M-56 has fairly uniform structure with no central condensation and lies about 46,000 ly's distant.

Located about 45% of the way from Beta to Gamma Lyrae, and slightly south of a line joining them, is the famous Ring Nebula (M-57), probably the best known example of a planetary nebula. It was found by the French astronomer Antoine Darquier of Toulouse in 1779 with a 3" telescope. Charles Messier found it a short time later, while observing the comet of 1779. It is oval shaped and about $83''$

by $100''$, a little larger than the angular size of Jupiter. In a small telescope at low power, it resembles an out of focus star. At least a 6" telescope is need to clearly see the "Ring Appearance". The

central star, at magnitude 15.4, was first reported by F. Von Hahn in 1800, and there may be evidence that it is variable. It is a bluish dwarf near the end of its life, with a surface temperature of about $100,000^\circ\text{K}$ and a computed density several thousand times that of the sun. Stars of this type are the hottest known, and produce strong ultraviolet light, which causes the fluorescence in the rarefied gases of the nebula.

The total amount of material in M57 is well under one solar mass. The density of a typical planetary nebulae is fairly well known from theoretical calculation; being about 10,000 atoms per cubic centimetre, or 1,000 times better than what would be considered an excellent vacuum by earthly standards. The constituent densities of the Ring Nebula compared to air is as shown in Table 1.

The gas composition is not unlike that of the Orion nebula, with the density of the various constituents being more or less ten times greater. [The reader can refer to my previous article on Orion for the exact figures.]

The distance to the Ring Nebula is uncertain, but is generally accepted to be about 1,400 ly's. The nebula is expanding at about 12 mi/sec, implying that it has required a maximum of 20,000 years to reach its present diameter. Measurement of the diameters of various planetary nebulae over a period of time has led to inconsistent results compared to the expected changes; computed from radial velocity measurement. The observation is always less than predicted, leading to speculation that apparent edge of the planetary does not represent a real boundary, but simply marks the zone where the distance from the central star has become too great to allow the illuminating process to operate efficiently. This zone can change, since it depends on the density of the gas in the nebula and the temperature (i.e. radiation intensity) of the illuminating star.

Just a little something to ponder, when you next gaze in the direction of Lyra. If I could just figure out how to build a star bridge out of birds, or was that a bird bridge to the stars? Ω

Table 1

Element atoms/ft ³	Ring Nebula atoms/ft ³	Air (times a thousand million!)
Hydrogen	262,000	718,000
Helium	20,800	3,750,000
Oxygen	154,000	300,000,000
Nitrogen	77,000	1,120,000,000
Neon	23,000	13,000
Sulphur	14,000	-
Argon	2,000	6,700,000
Chlorine	500	-
Fluorine	60	-



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Notice of Meetings and Events

Date: "Nova East '93" August 20th to 23rd.
Place: Fundy National Park, New Brunswick
Details: See the article in the June 1993 issue of *Nova Notes*.

Date: **Regular Meeting - Friday, September 17th: 8:00pm.**
 7:00pm for the executive meeting (all welcome).
Place: Lower Theatre, Nova Scotia Museum of Natural History,
 Summer Street, Halifax. Access from parking lot.
Topic: Dr. Malcolm Butler, a new faculty member at SMU
 Astronomy and Physics, will be speaking on **"Neutrinos
 from the Sun"**. As is usual for the September
 meeting, brief reports of the summer's
 astronomical events will be presented.

Date: **Regular Meeting - Friday, October 15th: 8:00pm.**
 7:00pm for the executive meeting (all welcome).
Place: Lower Theatre, Nova Scotia Museum of Natural History,
 Summer Street, Halifax. Access from parking lot.
Topic: Dr. Larry Bogan, from the Department of Physics at
 Acadia, will be speaking on **"Deducing Asteroid Shapes
 from the Earth"** (or "An Amateur Astronomer
 Having Fun with a CCD on a Research
 Telescope").

Halifax Planetarium Shows

The Halifax Planetarium, located in the Dunn Building at Dalhousie University, provides shows each week on Thursday evenings at 7pm. There will be no public shows during August, but shows resume after labour day in September. Contact the *Nova Scotia Museum of Natural History* at 424-7353 for show information.

1993 Halifax Centre Executive

Honorary President	Dr. Murray Cunningham	
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