



Tarsus

March
2008

Issue
No. 580

CIRCULAR OF THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES Inc

Next Meeting of the Entomological Society of NSW Inc

Where: Meeting Room 2, Ermington Community Centre, River Road, Ermington

When: 7.30 pm on Wednesday, 5th March 2008

55th Annual General Meeting

&

Launch of our new evolving web page

AGENDA

1. Apologies
2. Minutes of the 54th Annual General Meeting.
3. 55th Report of the Council presented by Hon. Secretary.
4. 55th Report of Hon. Treasurer.
5. 55th Report of Hon. Editors
6. 55th Report of Hon. Business Manager
7. Election of Council for 2008:
 - President
 - Vice-President
 - Hon. Secretary
 - Hon. Treasurer
 - Hon. Business Manager
 - Hon. Public Officer
 - Hon. Editor
 - Hon. Circular Editor
 - Four Councillors
 - Selection of Society Emblem for 2008.
8. Web Page launch
9. Show & Tell
10. Supper

The Council is pleased to report that we have people willing to stand for all key positions, so please don't avoid the meeting because you don't want to be pressured into taking a job. We would of course welcome any further nominations if anybody feels they really want to give any particular job a try.

There are also 4 optional positions for Councillors that can be filled if anyone wants to "put a toe in the water" just to see how the Council runs. Basically these Councillors have no responsibilities but can attend the Council meetings (held on the same night as the General Meetings, starting at 6.30pm). It's a good way to contribute to the discussion and if you feel like it, volunteer for jobs that sound interesting. These are optional positions that don't need to be filled.

We will also be officially "launching" our new web page, which we hope will better serve members in terms of keeping them up to date and allowing them to download publications.

Please bring along any items of entomological interest for "Show & Tell" after the formal meeting. The meeting will finish with tea/coffee and biscuits.

SPECIAL OFFER

Gith has a surplus of newly hatched Goliath stick insects that she is willing to give away. This offer is only valid for those attending the AGM. Within a few weeks or months you will need to provide a tall cage as they grow quite large, but at the moment they are still small.

Please note that only Financial Members for the year 2008 may vote or be nominated and elected to the Society Council

A proxy vote form is included on Page 137 if you want to have your say but can't attend

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NOTICE: Statements made in the Circular do not necessarily represent the views of the Entomological Society of New South Wales Inc. TARSUS is for educational purposes only. TARSUS is prepared by for ESNSW by Graeme Smith Ph: 02 9981 3749 Email: le_gbsmith@optusnet.com.au

February meeting - Sydney Olympic Park

Mosquito Talk at Sydney Olympic Park

On the evening of 6 February a group of fifteen visitors braved the rain torrents that kept hammering the roof of the Field Studies Centre, as Dr Cameron Webb from the Westmead Hospital Department of Medical Entomology gave a talk about mosquitoes after the Society's General Meeting.

The meeting venue was arranged courtesy of Dr Swapan Paul, who is the Wetlands Manager at the Park, and he specialises in keeping the unique and protected saltmarshes and also freshwater areas ecologically healthy, as well as accessible for a broad range of visitors. The Field Studies Centre is an important venue for wetland education and holds a collection of associated biological specimens of flora and fauna. The Centre houses live native amphibians, fish, and insects and provides education tools such as manuals, posters and microscopes. A keen bull frog male kept announcing its presence during the Entomological meeting.

The Sydney Olympic Park caters for over 20,000 school children a year and they come for wetland excursions and education at the Centre as part of the School Curriculum. The mangrove board walk has educational signage and is very popular. The Park also organises education and training workshops for wetland professionals, and topics have included mosquitoes, wetland ecology, constructed wetlands, and wetland macrophytes.

Sydney Olympic Park Authority, which manages the most extensive saltmarshes in the region, have been working since 1997 in close liaison with NSW Health through the Department of Medical Entomology, as well with surrounding local governments, with monitoring numbers of local mosquito populations and educating about saltmarsh mosquitoes. The main species, the Saltmarsh Mosquito (*Aedes vigilax*), disperses for kilometres away from its breeding sites and gives particularly painful bites, also throughout the day.

Dr Cameron Webb and his colleagues survey the saline wetlands within Sydney Olympic Park each week during summer months, and then the Authority carry out regular larviciding on merit using a biological product. The monitoring and spraying program evidently reduces the number of potentially emerging saltmarsh mosquitoes by over 90%, to much relief by residents and visitors in the region.

Ms Gith Strid-Nwulaekwe



Cameron Webb's talk was accompanied by some excellent slides



The General meeting before Cameron's talk



Gith discussing local mosquito problems with a visitor



The mosquito fauna of NSW: Past present and a future with climate change

Cameron E. Webb & Richard C. Russell

Department of Medical Entomology, The University of Sydney and ICPMR, Westmead Hospital, Westmead, NSW 2145, Australia Email: cameron.webb@swahs.health.nsw.gov.au

Introduction

Mosquitoes are small but incredibly complex organisms that have evolved to exploit even the tiniest of environmental niches. Mosquitoes have adapted their larval and adult morphology, ecology, physiology, and life cycles to suit a diverse range of environments. From coastal rock pools to alpine snowmelt pools, the immature stages of mosquitoes can be found in almost every type of aquatic habitat. The adult stages make their presence felt every summer and, although they provide food for birds, bats and frogs, their nuisance-biting and potential transmission of disease-causing pathogens have increased concern amongst local authorities as to how mosquito populations can be managed with respect to predicted climate change.

There are several important human diseases transmitted throughout Australia by mosquitoes, including Dengue, Murray Valley encephalitis (MVE), Ross River virus (RRV) disease and Barmah Forest virus (BFV) disease. Malaria is a serious health concern in many parts of the world, but in Australia in recent decades it has been rarely transmitted and only in the far north of Queensland. In NSW, human disease caused by RRV and BFV is an annual concern and in some areas, particularly coastal areas experiencing rapid urban expansion, activity of these viruses in mosquito populations and notification rates of human disease are increasing. However, the public health risks vary with location as the mix of mosquito species and presence of mosquito borne pathogens varies and predicting how these risks respond to changes in temperature, rainfall and sea level is difficult.

The mosquito fauna of NSW

There are approximately 100 mosquito species recorded from NSW with the most common mosquitoes belonging to the genera *Aedes* and *Culex*. The most important pest species are *Aedes vigilax*, *Aedes procax*, *Aedes notoscriptus*, *Anopheles annulipes*, *Coquillettidia linealis*, *Culex quinquefasciatus*, *Culex annulirostris* and *Verrallina funerea* although there may be other species that represent localised pest risk when suitable environmental or climatic conditions occur (e.g. flooding).

The majority of mosquitoes can be grouped into one of four categories based on their preferred larval habitat type and although there are some species that may be found in two or more of these categories, generally there will be one habitat type in which they are most commonly found. These four habitat based classifications are estuarine mosquitoes (species typically associated with saline and/or brackishwater coastal habitats influenced by tides such as mangroves, saltmarshes and sedgeland), freshwater mosquitoes (species typically associated with permanent well vegetated freshwater habitats), floodwater mosquitoes (species associated with highly ephemeral freshwater or brackish water habitats) and urban mosquitoes (species typically associated with a range of man-made structures including rainwater storage and waste-water infrastructure).

The most important pest in coastal areas of NSW is *Aedes*, a dark, medium sized mosquito with pale bands on the legs. The larvae of this species are usually associated with tidally influenced saltmarsh and mangrove habitats. Eggs are laid at the base of vegetation and/or on damp soil and can tolerate desiccation for many months. Population increases of this species are closely linked to the inundation of habitats by the highest tides of each month, and/or major rainfall events, and the adults can disperse great distances (> 10 km) from breeding habitats.

In inland areas of NSW, *Culex annulirostris*, a medium sized, light to dark coloured mosquito with a banded proboscis is the major nuisance biting and vector species. Larvae are commonly collected from a range of freshwater habitats from flooded grasslands to permanent, well-vegetated wetlands and while the importance of this species is generally overshadowed by estuarine mosquitoes in coastal areas, this mosquito is becoming of greater concern as constructed freshwater wetlands are



Fig. 1- Saltmarsh mosquito habitat - Example of coastal saltmarsh that provides habitat for the most important pest mosquito in coastal NSW, *Aedes vigilax* (photo C. Webb, Dept. Medical Entomology/University of Sydney)

increasingly incorporated into urban developments along the NSW coast. *Coquillettidia linealis* is a medium sized, dark mosquito with golden scales on the thorax. This species has the potential to be a nuisance-biting pest but little is known of its role in arbovirus transmission. The larval biology of this species differs markedly from most other mosquitoes as the larvae have a modified siphon that, instead of connecting to the water/air interface to breathe, attaches to the roots and/or stems of aquatic vegetation to obtain air.



Fig. 2- Saltmarsh mosquitoes emerging - mass emergence of adult *Aedes vigilax* from pupae (photo C. Webb, Dept. Medical Entomology/University of Sydney)

Mosquitoes associated with floodwater habitats have not been the focus of research to the same degree as estuarine, freshwater and urban mosquitoes. However, species such as *Aedes procax* and *Verrallina funerea* are emerging pests, particularly on the north coast of NSW where urban development continues to encroach on floodwater habitats, particularly tea tree swamps. *Aedes procax* is a small to medium sized brownish mosquito with banded legs. The larvae of this species are found in freshwater and (mildly) brackish ground pools in bushland or heath land habitats. Little is known of the role this species plays in the transmission of arboviruses. However, arboviruses are regularly isolated from specimens collected in coastal areas. *Verrallina funerea* is a small to medium sized dark mosquito. The larvae of this species are most commonly collected from freshwater and brackish flooded Melaleuca and Casuarina woodlands, with its population abundance generally increasing towards northern NSW. Unlike *Aedes vigilax*, these two species are not thought to travel far from larval habitats.

As a result of their close association with urban habitats, *Aedes notoscriptus* and *Culex quinquefasciatus* are responsible for considerable pest impacts. *Aedes notoscriptus* is a small to medium sized mosquito with conspicuous dark with pale banded legs and a silver to golden 'lyre' shaped pattern on the thorax and the larvae are usually associated with small water holding containers around dwellings such as tins, pots, ornamental ponds, roof guttering and tyres, as well as water holding plants (e.g. bromeliads) and tree holes. *Culex quinquefasciatus* is a medium sized pale brownish mosquito and comes indoors at night. The larvae of this mosquito are usually associated with, but not limited to, habitats with a high organic content such as drains, sullage pits, septic tanks and other water holding and water storage areas.

Exotic and not so exotic mosquitoes

It has been proposed that the increased temperature (and possible increases in rainfall and humidity) associated with predicted climate change may extend the range of exotic mosquito species into NSW and with them 'tropical' diseases such as Dengue and Malaria. However, historical records show that vectors of both diseases, along with local transmission of pathogens, are known in NSW.

A known vector of Dengue, *Aedes aegypti*, was once present in NSW and confirmed cases of Dengue have been reported in northern areas of the state. The reasons for the decline of this species in NSW are not well understood but it is thought that unsuitably cold winters, a reduction in available habitats (e.g. rainwater tanks) and decreased opportunities for the reintroduction of the species during the warmer months may have all contributed. Malaria has also been reported from NSW and while not considered an effective vector, the locally abundant *Anopheles annulipes* is thought to have been responsible for the transmission of Malaria from returning soldiers to local residents.



Fig. 3 *Aedes procax* - emerging pest species in coastal NSW; closely associated with ephemeral habitats in tea tree swamps (photo S. Doggett, Dept. Medical Entomology)

The impact of rainfall, temperature and sea level change

Mosquitoes and mosquito-borne disease are often discussed as a major concern should climate change result in global warming and/or sea level rise. The greatest concern is that, with increased temperatures, the geographic range of pest and vector species will increase and with it the risk of human disease, particularly "tropical" diseases such as Malaria and Dengue. However, there are many factors beside temperature including the availability of suitable habitats, short term changes in rainfall and tidal heights, urbanisation and mosquito control programs that influence the distribution and abundance of mosquitoes as well as the incidence of human disease.

While the risks of 'tropical' diseases are unlikely to rise with predicted climate change, there may be a local increase in the risk of arboviruses including RRV, BFV and/or MVE. With overall warmer temperatures, there may be a decrease in the incubation period (the time between when a mosquito is infected with a virus and when it is capable of transmitting the virus to humans) of the viruses in local vector species. This will mean that a potentially greater proportion of mosquitoes can transmit arboviruses in the local area. In addition, the warmer weather may not increase the magnitude of population increases but it may extend the period of mosquito activity, increasing nuisance-biting and potential public health risks in the Spring and late Autumn.

The spatial and temporal changes in rainfall will influence the response of local mosquitoes. A shift from winter to summer rainfall may provide increased opportunities for freshwater mosquitoes but in regions where rainfall declines during winter, overall mosquito populations may decline. The way humans manage water will indirectly influence mosquito populations as well with increased domestic rainwater storage (e.g. rainwater tanks, buckets, drums etc) increasing opportunities for *Aedes notoscriptus* and *Culex quinquefasciatus* while during periods of high rainfall, the redirection of water to agriculture or wetland rehabilitation may influence local mosquito populations.

It is highly unlikely that any rise in sea-level will result in a significant change to the mosquito fauna (either the species composition or abundance). In some cases, if sea level rise results in a decrease of coastal saltmarsh habitat, the populations of *Aedes vigilax* may decline. However, in some areas there will be a shift from brackish water to estuarine habitats, providing additional habitats for *Aedes vigilax*.

An assessment of the impact of climate change is a complex process (with much debate surrounding the potential magnitude of temperature, rainfall and sea level change, if any) but the pest and public health impacts of mosquitoes in the future may be determined as much by urbanisation and wetland management strategies as any change to the climate of NSW.



Fig 4- *Aedes notoscriptus* - The most common pest mosquito in urban areas; this species is closely associated with small water holding containers
(photo S. Doggett, Dept. Medical Entomology)

February meeting - Show & Tell

Barbara May showed a photo of a cossid emerging from an Acacia.

Gith Strid-Nwulaekwe has a lot of Goliath stick insects. The eggs only took a few weeks to hatch.

Dinah Hales bought pinned specimens of Auchenorrhyncha (white eyes and green bellies when live), a Cydnid bug and a reduvid (*Pristhesancus?*) - all collected at Beecroft.

Howard Greening bought some large black cockroaches and a spider (*Nepala*).

Fred Swindley bought wanderer butterfly puparia from which a Tachinid parasite larvae had emerged and pupated.

Treasurer's Annual Report for 2007

Summary of Results for 2007

The financial result for the year 2007 shows a modest gain of \$519.18 as can be seen on the first part of the balance sheet as the final figure in 'Results for the year'. This compares with a gain of \$913.99 for the previous year of 2006.

Because we have lost more members this year, the income for 2008 is expected to be down a little from this year. However, our financial situation is still satisfactory.

The amount from member's subscriptions for 2007 was:	\$3,575.00	
The Journal income for 2007 was:	\$2,020.00	
Other miscellaneous income was:	<u>\$419.85</u>	\$6,014.85

General Fund expenses for 2007(excluding \$3,000 payment between Funds):	\$1,633.49	
Publication Fund expenses for 2007 were:	<u>\$3,790.18</u>	<u>\$5,423.18</u>

Giving a surplus of **\$591.18** for 2007.

Looking Ahead to 2008

Looking ahead to the 2008 results, it would appear that there is likely to be a break-even end result or a small loss if expenses are about the same as 2007.

This forecast indicates that the present membership and Journal subscription income level should be adequate till at least 2009.

Edward E Taylor
Honorary Treasurer



Chrysolopus spectabilis

THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES
STATEMENT OF INCOME AND EXPENDITURE FOR THE YEAR ENDED 31 DECEMBER 2007

GENERAL FUND

INCOME

Members subscriptions received and receivable	\$3,575.00	
Bank Interest	\$269.73	
Zoo Night Meeting Profit	<u>\$28.79</u>	\$3,873.52

PAYMENTS

Insurance - Public liability	\$771.01	
Meeting Room hire	\$427.50	
Ent. Soc. of Australia affiliation fee to June 2007	\$52.25	
Ent. Soc. of Australia affiliation fee to June 2008	\$110.00	
Lodgement of Incorporation Statement and New Constitution	\$80.00	
Speakers' Gifts	\$75.49	
Book Prize for St Ives Exhibit	\$25.94	
Spooner-Hart Funeral Donation	\$60.00	
Tarsus Editor Postage	\$31.30	
Members payment for Journal	<u>\$3,000.00</u>	<u>\$4,633.49</u>
		Result for 2007: (\$759.97)

PUBLICATION FUND

INCOME

Journal income received and receivable		\$2,020.00
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Less: Cost of Journal

Opening stock at Committee's valuation	\$5,320.00	
Journal postage and stationary	\$404.95	
Processing and formatting J. Vol. 35	\$1,650.00	
Printing J. Vol. 35	<u>\$1,735.23</u>	\$9,110.18

Plus:

Closing Stock at Committee's valuation	\$5,320.00	
Company Associate Members	\$120.00	
Members payment for journal	\$3,000.00	
Bank interest received	<u>\$1.33</u>	<u>\$8441.33</u>

Result for 2007: \$1,351.15

BALANCE SHEET AS AT 31 DECEMBER 2007

ACCUMULATED FUNDS

Balance to 31 December 2006		\$17,310.15
Results for year	General Fund	(\$759.97)
	Publication Fund	<u>\$1,351.15</u>
Balance to 31 December 2007		\$17,901.33

REPRESENTED BY:

Cash at Bank	General Fund	\$10,797.19	
	Publication Fund	<u>\$2,754.14</u>	\$13,551.33

Cash on hand		\$200.00
Stock of Journals at Committee's valuation		\$5,320.00

Debtors	Members subscription arrears	\$525.00	
	Journal payment arrears	<u>Nil</u>	<u>\$525.00</u>
			\$19,596.33

Less:

CURRENT LIABILITIES

Subscriptions in advance	\$1,605.00	
Advance payments for J. Vol. 37	\$90.00	
		<u>\$1,695.00</u>
		\$17,901.33

THE ENTOMOLOGICAL SOCIETY OF NEW SOUTH WALES

Membership at 31 December 2007

<u>CATEGORY</u>	<u>FINANCIAL</u>	<u>UNFINANCIAL</u>	<u>TOTALS</u>	2006 <u>TOTALS</u>
Ordinary	74	7	81	87
Special (Retired)	3	0	3	3
Student	3	5	8	13
Corporate	2	2	4	4
Company Associate	2	0	2	2
Honorary Life	<u>2</u>	<u>-</u>	<u>2</u>	<u>2</u>
Totals	86	14	100	111

LAPSED MEMBERS

Nigel Andrew (Stud.)	Isla Carswell
Mary Cannard (Stud.)	Greg Daniels
Andrew Guthrie (Stud.)	Nathan Pike (Stud.)
James Paterson	Paranjeet Singh
Margaret Sutton	Guy Williams

RESIGNED MEMBERS

Simone McMonigal

E E TAYLOR
Honorary Treasurer



Insect of the Month

"If you build it, they will come" - Field of Dreams Pt II - Garry Levot

It is a couple of years since **Field of Dreams (Pt I)** described the diversity of wood-destroying insects that had colonized my previously barren backyard in Toongabbie after I took ownership and established mulched, native gardens and built sleeper retaining walls. In the case of the sleeper retaining walls the quotation should probably read "*If your build it they will destroy it!*". Most of those sleepers are no more. Part II refers to my parent's backyard in Como (southern suburb of Sydney). My mum has always liked to have goldfish and for quite a while our old, disused concrete laundry tubs relocated into the backyard were home to several fishes. A couple of years ago the fish were becoming a little nervous as leaks in the tank caused alarming 'low tides' that necessitated frequent top-ups from the hose. An upgrade was called for and yours truly dug the hole and took delivery of a 300L kidney-shaped, pebble-creted fiberglass pond from Bunnings. The fish were delighted. The surrounding area was landscaped and the decision was made to install a submersible 12v pump and fountain. As expected, the pump filter required periodic cleaning but we were surprised that occasionally the fountain head became partially blocked causing a reduction in the spray pattern. The first time this happened I shoved a stick in the pipe and dislodged quite a bit of 'crud', put it back together and Bob's your uncle. The next time I decided to investigate the cause more thoroughly.

Under 60x magnification the crud turned out to be simuliid (black fly) larvae and pupae (see figures below). My previous experiences with black flies had all been negative, or more specifically, I was a walking blood meal for hundreds of adult flies - once in Picton on the south island of New Zealand and the other time on Whitehaven beach in the Whitsundays



Figure 1. Simuliid larva. Note the mouth-fans and circular 'holdfast' structure. Photograph: Lowan Turton



Figure 2. Simuliid pupae. Note the respiratory gills. Photograph: Lowan Turton

as the spout of the fountain. The larvae are gregarious and cling tightly to the substrate aided by a series of concentric circles of minute hooks on their posterior ends that act like a sucker. They possess a pair of mouth-fans that direct and filter minute particles into their mouth. These structures are clearly visible in Figure 1.

The larvae pupate *in-situ*. A pair of gills protrude through the pupal cocoon (see Figure 2). In Figure 3 you can see the pharate adult inside the pupal case. The adult fly emerges from the cocoon and travels to the water surface on a bubble of air collected during the transformation period.

(it is not a paradise as the sun goes down and you and the black flies have to co-exist). This time we were not being bothered by the biting flies so I suspect the species in the pond bite only birds or some other hosts. Only females take blood.

Simuliidae breed only in running water. Classically, fast-moving, pristine freshwater creeks and rivers are listed as preferred breeding areas but apparently 300L kidney-shaped, pebble-creted fiberglass pond from Bunnings will suffice if paired up with submersible 12v pump and fountain. There are no permanent fresh water creeks anywhere close to my parent's home. Simuliids reportedly don't venture far from their breeding sites so the source of the flies that took up residence in the pond remains unknown.

Eggs are laid into fresh water or onto partially submerged objects such



Figure 3. Late stage simuliid pupa. Note the red eyes of the pharate adult fly. Photograph: Lowan Turton

The Entomological Society of New South Wales Inc.

APPOINTMENT OF PROXIES

I, of
being a member of the above-named Society, hereby appoint
of
as my proxy to vote for me on my behalf at the Annual General Meeting, as
of the Society, to be held on the 5th March 2008, and at any adjournment thereof.
Signed this day of 2008
Signature
(A photocopy of this form may be used)

The Entomological Society of New South Wales Inc.

NOMINATION OF OFFICER OR COUNCILLOR

I nominate
for election to the office of
Name of nominator
Signature Date
I second this nomination Name of seconder
Signature Date
I accept this nomination*
Signature Date
(A photocopy of this form may be used)

Please send all nominations to the Secretary, at the Society address

Bi-monthly Meetings

The Society will meet only **BI-MONTHLY** unless otherwise advertised. General meetings with a speaker will generally be held only on the “odd numbered” months (March, May, July, September, November) while the Council may meet more frequently. Speakers tentatively scheduled for the coming general meetings are shown below.

This timing allows us to alternate meetings with the Society For Insect Studies (SFIS) which meets at the Australian Museum at 7.30 on the second Tuesday of the “even numbered” months.

Future Events

Date	Speaker	Title
5 March, 2008 7.30 pm	Launch of new web page	Annual General Meeting
2008 TBD	Robert McDougall	Alpine Ants
2008 TBD	Graeme Smith (Reckitt Benckiser)	Testing consumer pest control products

Venue:

Meeting Room 2
Ermington Community Centre
10 River Road Ermington

Meetings start at 7:30 p.m.

Talks run for around 45 minutes, with 10 minutes for questions. Guests are most welcome.

Getting there:

By Car: From Victoria Rd turn into Spurway St (head towards Parramatta River). Turn right into Jackson St then left into River Rd. If heading north on Silverwater Rd, turn right into Victoria Rd then proceed as above. If heading south on Silverwater Rd take the Parramatta off ramp, cross Victoria Rd and proceed into River Rd. If you miss the off ramp, turn left into South St, then left into River Rd.

By Bus: Routes 525, 523 and L20 depart from Argyle St near Westfield shopping centre near Parramatta station. Routes 523 and L20 depart from West Ryde station. Get off at the Ermington shops. River Rd passes between the supermarket and the hotel.

SOCIETY POSTAL ADDRESS

C/- ENTOMOLOGY DEPARTMENT
THE AUSTRALIAN MUSEUM
6 COLLEGE STREET
SYDNEY NSW 2000

MEMBERSHIP FEES 2007

ORDINARY MEMBERS	\$50
COMPANY ASSOCIATES	\$60
STUDENT MEMBERS	\$25
CORPORATE MEMBERS	\$50

OFFICIALS

PRESIDENT	Could this be you?
VICE PRESIDENT	Dr BARBARA MAY
HON SECRETARY	Dr MARY ANN TERRAS
HON TREASURER	Mr TED E TAYLOR
HON EDITOR	Dr GARRY LEVOT
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