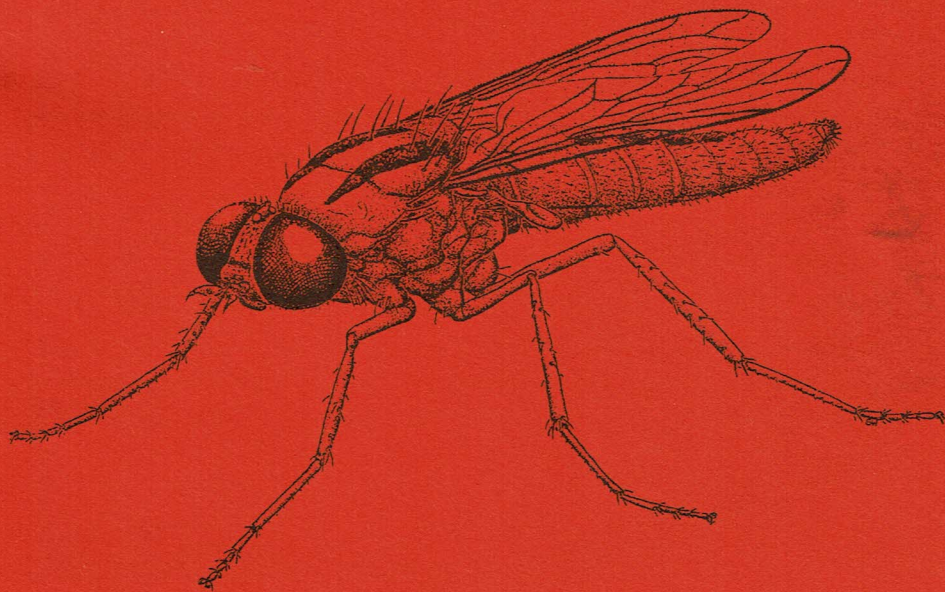




# ENTOMOLOGICAL SOCIETY OF QUEENSLAND NEWS BULLETIN



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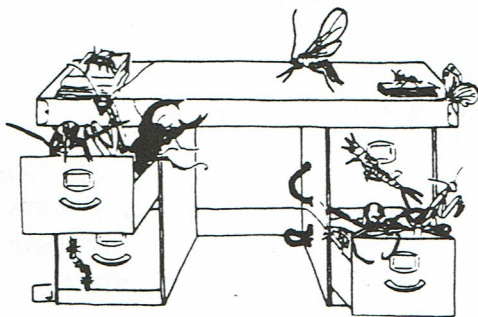
The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia and particularly in Queensland. Membership is open to anyone interested in Entomology. The Society promotes liaison among entomologists through regular meetings and the distribution of a *News Bulletin* to members. Meetings are announced in the *News Bulletin* and are normally held in the Entomology Department, The University of Queensland at 6.30 pm on the second Monday of each month (March to June, August to December each year). Visitors and prospective members are welcome. Membership information can be obtained from the Honorary Secretary or other office bearers.

Contributions to the **NEWS BULLETIN** such as items of news, trip reports, announcements, etc are welcome and should be sent to the *News Bulletin* Editor.

The Society publishes **THE AUSTRALIAN ENTOMOLOGIST**. This is a refereed, illustrated journal devoted to entomology of the Australian region, including New Zealand, Papua New Guinea and islands of the south western Pacific. The journal is published in four parts annually.

**EMBLEM:** The Society's emblem, chosen in 1973 on the 50th anniversary of the Society, is the king stag beetle, *Phalacrognathus muelleri* (Macleay), family Lucanidae. Its magnificent metallic purple and green colouration make it one of the most attractive of all Australian Coleoptera. It is restricted to the rainforests of northern Queensland.

**COVER:** A stiletto fly belonging to an undescribed genus and species of Therevidae (Diptera: Asiloidea) drawn by Shaun Winterton. Shaun and David Yeates are currently working on the systematics on this family, which is extremely diverse in the woodland and semi-arid habitats of Australia.



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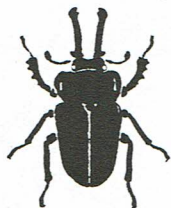
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The issue of this document does **NOT** constitute formal publication for the purposes of the "International Code of Zoological Nomenclature 3rd edition 1985". Authors alone are responsible for the views expressed.

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## THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND

### GENERAL MEETING

Minutes of the General Meeting of the Entomological Society of Queensland Inc. held in Room 402, Hartley Teakle Building, University of Queensland, on 10 June 1997, at 6.30pm. Chaired by G. Gordh.

**Attendance:** L. Barton Browne, C. Burwell, H. Butz, V. Davies, S. Evans, G. Gordh, D.S. Kettle, J. King, C. Lambkin, J. Lamy, P. LaBrie, A. Loch, P. Mackey, E.N. Marks, G. Maywald, S. McGrath, D. Merritt, L. Miller, G. Monteith, S. Monteith, L. Muir, H. Nahrung, C. Palmer, E. Reye, C. Rodriguez, M. Schneider, O. Seeman, D. Walter.

**Visitors:** K. Latiner, D. Lice, N. Power, H. Proctor, B. Russell, C. Thomsen, B. Weiss, A. Zwick.

**Apologies:** J. Christensen, E. Exley, T. Withers, D. Yeates.

**Minutes:** The Minutes of the last General Meeting were circulated in News Bulletin Vol. 25, Issue 3. It was moved C. Lambkin, seconded D. Walter that the Minutes be accepted.

#### **Nominations:**

**Jeff and Angela Skevington**  
4/5 Montrose Road  
Taringa  
Qld. 4068

Nominated by D. Yeates  
Seconded by G. Daniels

**Dr Heather Proctor**  
Dept. of Entomology  
University of Qld.  
Qld. 4072

Nominated by D. Walter  
Seconded by D. Yeates

**Dr Jenny Ovenden**  
Zoology Dept.  
University of Qld.  
Qld. 4072

Nominated by G. Monteith  
Seconded by C. Burwell

**Beth Russell**  
130 Livesay Road  
Moggill  
Qld. 4070

Nominated by C. Burwell  
Seconded by L. Muir

In accordance with the Society's rules, these candidates will be considered for election at the next General Meeting.

**Elections:** The following nominations were received at the May General meeting and circulated in News Bulletin Vol. 25, Issue 3.

**C. Palmer**  
Department of Entomology  
University of Queensland  
Qld. 4072

Nominated by D. Yeates  
Seconded by C. Lambkin

**Austin McLennan**  
Alan Fletcher Research Station  
PO Box 36  
Sherwood  
Qld. 4075

Nominated by H. Nahrung  
Seconded by C. Burwell

The nominees were elected by a show of hands.

### **General Business:**

1. Details of the Society's group booking for the movie Microcosmos were given.
2. The 1997 Student Award of \$250 was presented to Mrs Christine Lambkin of the University of Queensland. The Senior Vice-President then invited Christine to present a talk based on her winning entry as the first item of the Notes & Exhibits evening.

## Main Business: Notes & Exhibits.

1. Mrs Christine L. Lambkin  
1997 Student Award Winner  
Honours, Department of Entomology, University of Queensland

### " Characters, Congruence, and Bee Flies (Diptera: Bombyliidae)"

My honours thesis examined relationships, species-groups and character congruence in the Australian representatives of a genus of bee flies. The bee flies that I studied belong to the Family Bombyliidae, Sub-Family Anthracini. My project involved both a taxonomic and systematic examination of the Australian representatives of the genus *Anthrax*, as currently defined. There are over 240 described species in this cosmopolitan genus. *Anthrax* are very commonly collected in Australia.

Scopoli erected the genus *Anthrax* in 1763 describing the circlet of hairs on the tip of the antennae. This is now the diagnostic feature of the tribe Anthracini. Currently the tribe includes 9 genera. Two genera *Anthrax* and *Brachyanax* are currently described from Australia, distinguished by the shape of the base of the third antennal segment. Australia has 5 described species of *Anthrax* and 1 of *Brachyanax*. The recently completed revision of the Australian Anthracini by Yeates and Lambkin includes descriptions of 28 new species. This revision is not yet published, some of the names that I use are manuscript names and not yet available.

Members of the genus *Anthrax* are generally medium sized, black flies, often with patches of white or silver scales at the apex of the abdomen, especially in the males. The wings are highly patterned with opaque black and hyaline areas. In Australia a large group of *Anthrax* with almost hyaline wings contains the only highly coloured bee-like Australian Anthracini.



*Anthrax* larvae are parasites of immature wasps, bees, flies, beetles, grasshoppers, lacewings and moths. Usually the larvae parasitise mud wasps. Eggs are distributed near a potential host. The first instar is freelifving and finds the host, often a later stage immature within the ground or mud nest. The remaining instars are sessile, and feed upon a single host immature. The mobile pupa is armed with various spines, projections and armour to enable it to escape from the ground or mud nest. Adults, especially those with hyaline wings, are often found hilltopping, sunning themselves on rocks. Many *Anthrax* are found flying around damaged trees where wasps are building nests.

I closely examined over 1500 specimens of the Australian *Anthrax* and distinguished 125 different states or descriptors in 39 characters. Careful examination of a large range of characters instead of a reliance on a small number of easily observable, superficial features revealed the presence in Australia of a very interesting cryptic species-group. This group, distinguished generally by the hyaline wings, had previously been placed in collections under a single name, *Anthrax angularis*. Examination of the type specimen of *Anthrax angularis* showed that it belonged to a different tribe and genus. Only a very careful taxonomic revision including precise and time-consuming comparisons of microscopic variation in the male genitalia showed the presence of at least 20 species in this fascinating group.

Of the 20 newly described species belonging to this genus only three can be easily distinguished to species level from external morphological characters such as darker wing infuscation. The remaining 17 species fall into two groups distinguished by the presence on the dorsal abdominal surface of either two white spots or a band of white scales. Examination of the male genitalia is required to identify specimens to species.

Up to five of the species are sympatric - having been collected at the same place on the same day, even within a two-hour period in a clearing on Mt Cootha in Brisbane Forest Park. Initial studies suggest that there may be temporal or behavioural differences between the species. The discovery of this group shows the value of very careful modern taxonomic work. Only an examination of a large range of characters, instead of a reliance on a small

number of easily observable features, revealed the presence of the cryptic species. Diversity studies would at the most have recognised 5 species, and the other 15 species would have remained hidden.

An effort has historically been made to relate classification levels, such that genera belonging to one family are assumed to be more closely related, or derived from the same ancestral stock, than the genera from another family. This assumption holds at all levels of the classification. Traditionally organisms are placed into a particular genus because of the morphological characters that they have in common. More recently an effort is made to ensure that the morphological characters they have in common are homologous, that is similar in appearance since they have been derived from the same structure, not similar in appearance because of similarity of function.

Studies that include an effort to understand the relationships between the organisms have been termed systematics. Taxonomic work is based on an understanding of the underlying relationships of the groups in question. Taxonomy moves through the classification to its smallest unit, the species. Systematics groups the organisms, based on their relationships, and thus moves up through the classification hierarchy. Systematics by proposing a scheme of evolutionary relationships, provides a template for classifications to reflect those relationships. Systematists collect information from a large range of characters, compare homologous characters, those that are derived from the same structure, and analyse the data, often cladistically. Cladistics is an analytical method which aims to reconstruct the pattern of phylogenetic relationships between organisms. The resultant cladograms, or trees, group synapomorphies, organisms with the same derived structures, apomorphies.

Within *Anthrax* I used systematic studies to show species-groups based on large number of characters and quantitatively indicate those characters of taxonomic value.



Attempts were made by Bezzi in 1924, Marston in 1963 and 1970, and Hull in 1973 to divide *Anthrax* into species-groups on the basis of the distinctive wing patterns. However little success had been found in finding other characters to support these species-groups.

On first examination the Australian species of *Anthrax*, as currently defined, fall into four groups with different wing patterns. However the species-groups based on wing patterns were not supported by other characters.

Male genitalia divided the Australian *Anthrax* into 4 different groups. Studies of female genitalia divided *Anthrax* into 5 different groups. The groups based on female genitalia have different members to those based on wing patterns or male genitalia

Using cladistic computer programs the characters were analysed and trees generated. Cladistic analyses using two computer programs, PAUP and HENNIG produced the same 30 most parsimonious trees. Most parsimonious trees are the shortest trees which explain all the data simultaneously in the fewest number of steps.

I found the same three large clades in all most parsimonious trees and concluded three species-groups are present. The members of these groups are not the same as those groups based on wing patterns or genitalia. Cladistic analysis recognised underlying patterns, and placed species into groups that had been difficult to place when looking at wing patterns or genitalia. Systematic studies indicated that the cryptic species with hyaline wings found in the taxonomic study all belonged to the same clade, together with two bee-like species, and a species with similar vestiture but more darkly infuscated wings. This species-group has been described in the recently completed, but as yet unpublished, revision as the new genus *Thraxan* Yeates and Lambkin.

I also analysed the character congruence or character agreement between seven morphological character sets and the rest of the morphological data collected from the Australian *Anthrax*. Character agreement was measured

using several different mathematical formulae, incongruence indices, including Miyamoto's IM and Mickevich and Farris's IMF. The statistical significance of the levels of incongruence was also investigated.

Character congruence studies indicated that wing pattern characters were significantly incongruent with the rest of the morphological data. Systematic studies explain the problems that earlier taxonomists experienced when trying to find characters to support the species-groups based on wing patterns. Wing patterns do not agree with the other characters within *Anthrax* in Australia. Genitalic characters, such as the presence of the dorsal plate at the apex of the epiphallus, and wing venational characters, such as the presence and position of spur-veins, agree with other morphological characters and could be considered more valuable taxonomically in this group. Species-grouping is based on not a single feature such as the wing pattern but a large suite of morphological characters.

### *Conclusion*

Careful comparative taxonomic work, involving the detailed examination of many morphological features, revealed the presence in the Australian fauna of a large cryptic species-group of more than 20 species, distinguished essentially by minute but consistent differences in the male genitalia. The discovery of this group shows the value of taxonomic work. Diversity studies would at the most have recognised 5 species, and the other 15 species would have remained hidden.

Cladistic analysis of the genus *Anthrax*, as currently defined, based on 39 characters in 125 states using PAUP and verified with Hennig found three species-groups in Australia, one of which is being described as the new genus *Thraxan* Yeates and Lambkin.

Cladistic examination of the worldwide fauna would be required to determine whether these species-groups are found elsewhere. It appears that *Thraxan* may be endemic to Australia.

Systematic character congruence studies of *Anthrax* indicated that the wing pattern characters were significantly incongruent with the other



morphological data. This incongruence supports the findings of taxonomists in studies of the genus in other parts of the world. While wing patterns appear consistent and distinctive, species-groupings based on wing patterns are rarely supported by other morphological characters. It is extremely difficult to divide this large genus into species-groups on the basis of any single set of characters. Many previous authors attempted to use wing patterns. It is not that simple. This study reveals that cladistic analysis is an extremely valuable systematic tool for taxonomists.

**Q:** What did you use as an out-group?

**A:** In one group of analyses I used all 9 genera of the tribe in the hope that one of those would turn up as a nice outgroup. Unfortunately, all but 1 turned into the in-group which indicates that *Anthrax* is highly paraphyletic. I then went to a sister group, a member of which we have 2 species in Australia as yet undescribed. Actually having the specimens is one of the most valuable things in cladistics, trying to score characteristics from published data is a nightmare. That's why I chose *Petrossia* from the sister group.

## **2. Electroplated insects: Peter Misic, Metal Magic**

It's a funny thing really, plating insects, I've been increasingly interested in them since we first purchased a 40 acre bush block some 15 years ago. Every now and then you would find a most spectacular specimen of a beetle or cricket and wonder at its being. So completely alien yet sharing the planet with us, indeed doing a far better job of it than we do. It has been argued that the purpose of life is to pass on the genes, if that's the case we certainly can't compare. Seems to me the purpose of life may be to fill the vacuum. If the conditions exist, an imbalance of nature, then a form of life will take advantage and fill that niche.

# ENTOMOLOGICAL SOCIETY OF QUEENSLAND

## PERKINS MEMORIAL LECTURE

*A biennial invited lecture to honour the memory of  
Frederick Athol Perkins, first Head of University of  
Queensland Entomology Department.*

### SPEAKER

David Rentz  
CSIRO Division of Entomology  
Canberra

### TITLE

*The World's Most Unusual Gryllacridid  
and Other Reasons to Visit Queensland*



## WHEN

*Monday, 8th September, 1997, at 6.30 pm.*

## WHERE

*Room 323, Hartley Teakle Building,  
University of Queensland, St. Lucia*

## SPONSORS

*Arrest-A-Pest Pty. Ltd.  
Rhone-Poulenc Rural Australia Pty. Ltd.  
Ciba-Geigy Australia Ltd.  
CRC for Tropical Pest Management*

Drinks and nibbles will be served from 6.00 pm  
in the Foyer adjacent to Room 323

# EVERYONE WELCOME

So it is with my insects, working as a watchmaker, quite some years ago I developed some dexterity and an appreciation for detail, (as well as a lot of hand tools!). Jewellery also tended to reflect on the rare and beautiful. Then 8 years as a psychiatric nurse and finding myself in the middle of a economic rationalisation program directed at the mentally ill, I decided to accept a whole lot of money not to go to work anymore. Putting into motion a plan to somehow capture the beauty of nature, utilising the insects around our property. After much research I settled on a plating process as it was possible to utilise the alternate power supply on our place. (wind & solar ) whilst still producing a quality product with a great finish.

Lynda Muir displayed an example and photographs of electroplated insects submitted by Peter, a member from Victoria. Peter has a business called Metal Magic and he sells arrangements of electroplated insects on a wooden base and covered by a crystal glass dome for \$80 - \$100.

### **3. Wildlife of the Cairns Region: Chris Burwell, Queensland Museum**

#### **Upcoming Wildlife of Cairns Book**

Two of the Queensland Museum's latest publications have topped the best seller lists. Since its release in October 1995, 23 000 copies of 'Wildlife of Greater Brisbane' have been sold and 13 000 copies of 'Wild places of Greater Brisbane' have been sold since October 1996. Following the success of these publications the Museum is working on a full colour guide to the wildlife of the Cairns region due for release early in 1997.

One of the problems encountered during the compilation of the insect sections of 'Wildlife of Greater Brisbane' was a shortage of good quality colour images of the species that the authors had selected to feature in the book. In order to avoid this in the Cairns book, Geoff Monteith and I decided to tackle the problem in a different way. We decided to travel to North Queensland with Jeff Wright, one of the Museum's three photographic staff, and to spend a week intensively photographing insects.



Those species which we photographed would largely make up the content of the insect section of the book.

We based ourselves at the 'Australian Insect Farm' run by Jack, Sue and Paul Hasenpusch, an area of lowland rainforest at Garradunga, just north of Innisfail. Jack and Sue have a lovely cottage set in the middle of rainforest which they rent out to all manner of entomologists that are collecting, filming or photographing insects. This proved the ideal base camp providing easy access to the lowland rainforest species with open forest and highland rainforest habitats only a short drive away.

All in all, the trip proved a resounding success. We obtained good quality, publishable images of over 120 species of mostly insects but also spiders, other invertebrates and reptiles. Those who attended the meeting can testify to the photographic skills of Jeff Wright. Geoff Monteith and I can only take credit for catching the beasts and making lots of cups of tea.

#### **4. Butterfly Breeders in Costa Rica: Phil LaBrie, Butterfly House, SouthBank Parklands**

##### **The First International Congress of Butterfly Exhibitors and Suppliers**

From the 12th to the 18th of March 1997 I attended the First International Congress of Butterfly Exhibitors and Suppliers (FICBES). The conference was held in Costa Rica and included activities ranging from paper presentations to collecting trips. The main purpose of this congress was to give an opportunity for butterfly farmers and ranchers to meet and discuss problems with butterfly exhibitors, and vice versa. Issues discussed included product quality; which included shipping and handling, disease and parasitism. Maintaining prices and stabilising the industry was another major concern.

The small industry of live pupae export generates \$3-\$5 million per. year globally. The major centres for butterfly farming are situated in Central and South America and South East Asia. This industry has benefited third world

economies by replacing or supplementing small subsistence farming incomes. The collapse of iguana farming in El Salvador, was presented and discussions undertaken to apply the lessons learnt in that situation to the butterfly farming industry.

All continents but Asia were represented at the conference with people attending from the UK, USA, Kenya, South and Central America and Australia. In total about 50 delegates attended. The conference was hosted by Joris Brinckerhoff who owns and manages the "Costa Rica Entomological Supply". The Key note address was presented by David Lowe, who manages the Guernsey Butterfly Farm. David is credited with starting the butterfly farming industry. Other speakers spoke on their particular attractions and the problems that they faced. Dr Melvin Dell showed an interesting display of the recently opened Niagara Parks Butterfly Conservatory which cost \$13 million to build and is 38m tall and the size of 5 football fields. That was just the flight arena. Dr Mike Weisman (Rocky Mountain Butterfly Pavilion and Insect Center) and Dr Tom Schneider (Detroit Zoo) spoke about keeping the public interested by the addition of other attractions such as other insects and birds. A number of papers were presented on the migratory patterns of Monarch butterflies. Government imposed regulations were discussed with the aim to lessen or remove such regulations so the industry can expand into countries such as Australia.

Field trips were undertaken to observe actual farms and to see the natural habitat where the butterflies live. I have learnt a great deal of the "mechanics" of butterfly farming and have implemented them in operations at the South Bank Butterfly house. I have made contacts with people around the world pursuing similar interests to mine.. The next conference will be held in Guernsey in 1998.

**Q:** The breeders who were using trees, did they rotate the trees?

**A:** No. The breeders knew from experience that a certain amount of branch would support a certain number of caterpillars. They use the same trees for years, but remember that everything grows very fast in that climate.



**Q:** Are the butterflies bred just to be sold as framed specimens?

**A:** No. There is a very lucrative trade in live pupae for Butterfly Houses, especially for establishments in colder climates where they cannot breed their own butterflies.

## 5. The INKA cell Brian Weiss, Entomology Dept., University of Qld

Inka Cells and Ecdysis-Triggering Hormone in the Cotton Bollworm *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae)

Holometabolous insects undergo a complex process of metamorphosis in the transition from the larva to the adult. Lepidopteran larvae generally undergo a series of five molts before pupating. Pupae then eclose as adults. Ecdysis is the process of shedding of the old cuticle which includes the body surface, cuticular lining of the fore and hindguts, and tracheal system. The initiation and successful completion of the entire insect molt is under hormonal control.

The recent report of a newly discovered hormone involved in ecdysis in the tobacco hornworm *Manduca sexta* prompted the search for this hormone in the pest lepidopteran *Helicoverpa armigera*. In *M. sexta* the hormone - termed Mas-ETH for its ecdysis triggering function - is released from a single Inka cell associated with each epitracheal gland. I found the homologous cell in *H. armigera*, located in approximately the same position and with the same histological appearance. The relatively large cells are packed with granular secretory material which accumulates before each moult. An ecdysis triggering function of Inka cell contents in *H. armigera*, here called Hea-ETH, was confirmed by injecting a crude extract into pharate and late stage pupae, inducing premature ecdysis in 66% of 30 pharate adult pupae tested.

Heliothis species are a major agricultural pest worldwide. The possibility of manipulating newly discovered hormones, such as Hea-ETH, for use as organic insecticides should be investigated. For example, recent advances



in recombinant DNA technology and genetic engineering could allow us to insert Hea-ETH-producing genes into the genomes of crop plants on which *Heliothis* feed. In doing so the transformed plant would produce Hea-ETH and disrupt normal growth and development of the insect. Another biotechnological approach could be to separate the 'address' and 'message' portions of the Hea-ETH amino-acid sequence. This would disrupt the hormone's ability to bind to the correct receptor and initiate a response, rendering the hormone useless.

**Q:** Why is the cell called an INKA cell?

**A:** The discoverer of the cell is Slovenian. According to the article, the cell was named after the Goddess of the Mountains in Slovenia.



The Vote of Thanks was given by Geoff Monteith who said that Notes & Exhibits are always pleasant evenings to come along to and that tonight had been a tour de force of a great range of subjects.

Members were reminded that the next Meeting is August 11th. There being no further business, the Senior Vice-President closed the meeting.

## **NOTICE OF FUTURE MEETINGS**

11 August: "The role of aquatic insects in river food webs"  
Stuart Bunn, Centre for Catchment and In-Stream  
Research, Griffith University.

8 September



# PEOPLE AND PROJECTS



NEWS FROM QDNR

Alan Fletcher Research Station, Sherwood.

As part of a new ACIAR Siam Weed project, Graham Donnelly plans to visit Papua New Guinea in late July to arrange for the commencement of the project.

Two lantana biocontrol agents, *Aconophora compressa* (Hemiptera: Membracidae) on *Lantana camara*, and *Chaidotis pygmaea* (Coleoptera: Chrysomelidae), on *L. montevidensis* appear to have established at sites in Yarraman and Narangba, respectively.

Shipments of *Homichloda barkeri* (Coleoptera: Chrysomelidae), a biocontrol agent approved for release on prickly acacia, have been received in quarantine for mass-rearing in Charters Towers, where it is currently being reared. Several species of geometrids were also received from Voi, for host-testing on prickly acacia, but collectors have been unable to locate the targeted psyllid, *Acizzia* sp. also for host-testing. The South-African field station is underway, with the second field entomologist to be advertised soon.



Ruth Huwer (QDNR, Charters Towers) visited Mareeba late in May. She was attending a meeting to organize a weeds conference in the Cairns area in July 1998. Biocontrol using insect herbivores will be a strong component of the as yet unnamed meeting.

Judy Grimshaw (AQIS, Mareeba) will be undertaking a quarantine survey of Cape York Peninsula in July, by road. Sites to be visited include Lockhart River, Portland Roads, Weipa and Old Mapoon.

Cairns campus of JCU had a short visit by Votcek Novotny. He gave an interesting talk on insect herbivores in New Guinea, where he is currently based undertaking the study. Another longer term visitor to JCU is Fred Stone from Hawaii, who is studying cave adapted cockroaches in the lava tubes at Undara.

The CRC-Tropical Rainforest Ecology and Management had a meeting over several days in Cairns in June. Several entomologists involved with TREM projects attended and gave talks. Rodger Kitching spoke on using several families of Lepidoptera to evaluate canopy studies. Chris Hill spoke on his closed forest dung beetle studies at Paluma. Chris Reid and Pete Cranston spoke at length on the large wet tropics dung beetle databasing project which also involves coworkers at QDPI and QM, Brisbane. Rumour has it that the rounds of ale afterwards were dealt with equal dedication as the technical discussions beforehand.



## NEWS FROM THE QUEENSLAND

### INSTITUTE OF MEDICAL RESEARCH Mosquito Control Laboratory, Brisbane

The WHO has invited Dr. Brian Kay to participate in a meeting on Dengue surveillance and control for the southeast Asia and western Pacific region. The meeting will take place in Manilla from 14-17th July.

Dr. Lynda Muir has decided to change careers and embrace motherhood full-time so from July 3rd Lynda will be delving into piles of dirty nappies instead of the mosquito olfactory system. Her fellow lab members wish her all the best.

Craig Jennings will attend the Australian Tropical Health and Nutrition Conference in Brisbane from 17-19th July. Craig will discuss 'Dengue in the tropics: Control of *Aedes aegypti* using copepods'.

## SOCIETY SUBSCRIPTION RATES

- ORDINARY:** Persons resident within the municipality of Brisbane - \$23pa (\$20 if paid by AGM).
- COUNTRY:** Persons resident elsewhere - \$21 pa (\$18 if paid by AGM).
- JOINT:** Couples in either of the above categories who share a copy of the *News Bulletin*, but each otherwise have full membership privileges.  
Ordinary - \$30 pa (\$27 if paid by AGM).  
Country - \$27 pa (\$24 if paid by AGM).
- ASSOCIATE:** Students and others at the discretion of the Society Council - \$15 pa (\$12 if paid by AGM). Associate Membership conveys full membership privileges except the right to vote on the conduct of affairs of the Society, to hold office and to nominate new members.

## THE AUSTRALIAN ENTOMOLOGIST SUBSCRIPTION RATES

- AUSTRALIA:** Individuals A\$16 pa Institutions A\$20 pa
- ELSEWHERE:** Individuals A\$20 pa Institutions A\$22 pa

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## OFFICE BEARERS 1997/98

### President

Dr David Yeates  
Dept Entomology  
University of Qld 4072  
**Ph: (07) 3365 2217**  
Fax: (07) 3365 1922  
Email:  
d.yeates@mailbox.uq.oz.au

### Honorary Secretary

Dr Lynda Muir  
QIMR, PO, Royal Brisbane  
Hospital 4029  
**Ph: (07) 3362 0352**  
Fax: (07) 3362 0106  
Email: lyndam@qimr.edu.au

Helen Nahrung  
AFRS, Qld Department of  
Natural Resources  
PO Box 36  
Sherwood 4075  
**Ph: (07) 3375 0726**  
Fax: (07) 3379 6815  
Email:  
nahrnh@citec.qld.gov.au

### Editor, *Aust. Entomol.*

Dr David Hancock  
PO Box 537  
Indooroopilly 4068  
**Ph: (070) 352 864**  
Fax: (070) 352 785

### Senior Vice-President

Prof Gordon Gordh  
Dept. Entomology  
University of Qld 4072  
**Ph: (07) 3365 1563**  
Fax: (07) 3365 1922  
Email:  
g.gordh@mailbox.uq.oz.au

### Honorary Treasurer

Gunter Maywald  
CRCTPM  
University of Qld 4072  
**Ph: (07) 3365 1857**  
Fax: (07) 3365 1855  
Email: gunter@ctpm.uq.edu.au

### Councillors

Chris Burwell  
Qld Museum  
PO Box 3300  
South Brisbane 4101  
**Ph: (07) 3840 7703**  
Fax: (07) 3846 1918

### *Bus. Mgr. Aust. Entomol.*

Andrew Loch  
PO Box 537  
Indooroopilly 4068  
**Ph: (07) 3365 2271**  
Fax: (07) 3365 1922  
Email:  
a.loch@mailbox.uq.edu.au

### Junior Vice-President

Dr Judy King  
QFRI, DPI Forestry  
PO Box 631  
Indooroopilly 4068  
**Ph: (07) 3896 9447**  
Fax: (07) 3896 9628  
Email:  
king@qfslab.ind.dpi.qld.gov.au

### News Bulletin Editor

Cathy Simpson  
CRCTPM  
University of Qld 4072  
**Ph: (07) 3365 1876**  
Fax: (07) 3365 1855  
Email: cathy@ctpm.uq.edu.au

Dave Merritt  
Dept Entomology  
University of Qld 4072  
**Ph: (07) 3365 3478**  
Fax: (07) 3365 1922  
Email:  
d.merritt@mailbox.uq.oz.au

## NOTICE OF NEXT MEETING

The next meeting of the Society will be held at 6.30 pm on **Monday 11 August** in Room 323, Hartley Teakle Building, UQ.

The main business will be: 'The role of aquatic insects in river food webs', Stuart Bunn, Centre for Catchment and In-Stream Research, Griffith University. Refreshments will be served before the meeting at 6.00 pm in the Tea Room (510). **VISITORS ARE WELCOME**