ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC

NEWS BULLETIN

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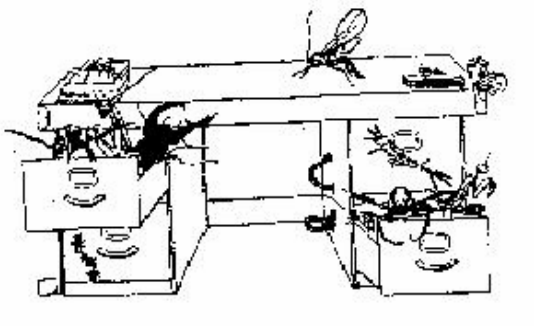
The **ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.**, since its inception in 1923, has striven to promote the development of pure and applied entomological research in Australia, particularly in Queensland. Membership is open to anyone interested in Entomology. The Society promotes liaison among entomologists 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 Goddard Building, University of Queensland at 7.00 pm on the second Monday of each month (March to June, August to December). Visitors and members are welcome. Membership information can be obtained from the Honorary Secretary, or other office bearers of the Society.

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 in the Australian region, including New Zealand, Papua New Guinea and the 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 purple and green colouration makes it one of the most attractive of all Australia Coleoptera. It is restricted to the rainforests of northern Queensland.

COVER: *Trichogramma, sp*., an egg parasitoid. Drawn by Catherine Bryant.



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The Entomological Society of Queensland

General Meeting May 2007

Minutes of the General Meeting of the Entomological Society of Queensland Inc. held in Room 139, Goddard Building, The University of Queensland, on 14th May 2007, at 7 pm.

Attendance:

Sassan Asgari, Desley Tree, Stephen Frances, Lynda Perkins, Richard Bull, Don Sands, Margaret Schneider, Michelle Baker, Anna Marcora, Matthew Purcell, Bradley Brown, Lyn Cook, Richard Zietek, Ross Kendall, Klaus Goffschaldt, Noel Starick and Christine Lambkin.

Apologies:

Gunter Maywald, Geoff Monteith, John Moss, Gio Fichera, Mike Furlong, Peter Allsopp.

Minutes:

The minutes of the April 2007 meeting were circulated in News Bulletin Vol 35, Issue 2. It was moved by Matthew Purcell they be accepted and seconded by Don Sands.

General Business:

The appointment of a new News Bulletin Editor, Anna Marcora, was announced and Anna was welcomed to the position.

Sassan Asgari indicated that the main business of the next general meeting is Notes & Exhibits. Those who are interested to present a short talk or exhibit should contact Sassan.

Don Sands announced a talk by Prof Tim New titled **"*Recovery Plans for Insects: Need, Design and Implementation*"** would be held at CSIRO Queensland Centre for Advanced Technologies, 2643 Moggill Rd, Pinjarra Hills on Friday 20th July, 2007 from 1-2pm. All are welcome and a light afternoon tea will be provided.

The meeting was advised colour pages would be used in some future editions of the News Bulletin and would add $1 per copy of the bulletin to the cost of printing.

Entomological Society of Queensland

Main Business
Introduction of exotic arboviruses and vectors into Australia

Dr Andrew van den Hurk, Virology, Queensland Health Scientific Services, Coopers Plains, Queensland.

Arboviruses

Throughout the world, mosquito-borne arboviruses are responsible for significant mortality and morbidity. Millions of human cases occur annually, with disease spectra ranging from mild febrile illness, through to fatal haemorrhagic fever or encephalitis. Important arboviruses include yellow fever, dengue, chikungunya, West Nile (WNV) and Japanese encephalitis (JEV) viruses. The majority of mosquito-borne arboviruses exist in a zoonotic cycle between maintenance and/or amplifying animal hosts and mosquitoes. Despite developing fatal disease, humans are often only incidentally infected and do not contribute to the transmission cycle. Exceptions include the dengue viruses and urban epidemics of yellow fever virus, for which humans are the main amplifying host. Many arboviruses are considered to be: a) emerging, where they have recently expanded their range to invade new areas; or b) re-emerging, where they cause explosive epidemics in areas where activity has been relatively stable.

The Australian situation

Australia is home to numerous enzootic arboviruses which cause human disease, including the alphaviruses, Ross River and Barmah Forest viruses, and the flaviviruses, Murray Valley and Kunjin viruses. In addition, periodic outbreaks of dengue fever occur in northern Queensland, facilitated by the importation of the virus by infected travellers. Similarly, JEV activity occurs almost annually in northern Australia. Finally, Australia is susceptible to the introduction and establishment of other exotic viruses, as well as exotic mosquito species. In collaboration with numerous government and university departments, at the Virology section of Queensland Health Scientific Services, we conduct research on the potential ecology of these exotic viruses

and vectors. This research focuses on either a) incriminating Australian mosquito species as potential vectors of exotic viruses; or b) assessing whether newly introduced mosquito species are vectors of enzootic arboviruses. Information from our work is then used to formulate targeted surveillance and control programmes. Examples of the research undertaken at our laboratories are provided below.

Detection of Japanese encephalitis virus in mosquitoes collected from northern Australia and New Guinea

Japanese encephalitis virus emerged in 1995 in the Torres Strait, resulting in five human cases and two deaths. The virus was detected in 1998 and 2004 on Cape York Peninsula on the Australian mainland. Since the initial outbreak in 1995, in collaboration with the Tropical Public Health Unit, Cairns, and the School of Molecular and Microbial Sciences at the University of Queensland, we have been investigating the ecology of JEV in northern Australia. One aspect of this work has been conducting virus detection on field collected mosquitoes from numerous locations ranging from the New Guinea highlands, through the Torres Strait and onto Cape York Peninsula. This work involves collecting mosquitoes with carbon dioxide-baited light traps. Mosquitoes are placed in pools of up to 200 individuals and virus is detected either by isolation in cell culture or molecular assays. Between 1995 and 2004, over 1.2 million mosquitoes were processed for virus detection. Overall, JEV was detected in 73 pools of mosquitoes, with 71 detections from *Culex sitiens* subgroup mosquitoes (which includes the morphologically similar *Culex annulirostris*, *Cx. sitiens* and *Cx. palpalis*), and single isolates from *Cx. gelidus* and *Aedes vigilax*. Sixty-eight detections were from Badu Island, the location of the original outbreak. High mosquito infection rates on this island were attributed to the presence of domestic pigs, and high mosquito populations. Three isolates were from the Western Province of Papua New Guinea, suggesting that this was the source of the incursions into northern Australia. In 2004, JEV was isolated for the first time from mosquitoes collected from Cape York Peninsula. However, there is no evidence to suggest that JEV has become endemic on the Australian mainland. Possible reasons for this include the presence of related viruses

which may compete with JEV for susceptible hosts or the propensity for *Cx. annulirostris* to feed on marsupials, which are not considered to be amplifying hosts of the virus.

Japanese encephalitis virus and flying foxes

The vertebrate hosts of JEV are wading birds such as herons and egrets and/or pigs. The relative role of native Australian vertebrate species in the virus transmission cycle is largely unknown. One group of animals that is of particular concern as a potential vertebrate host is the flying foxes (also known as fruit bats) of the genus *Pteropus*. Aspects of their ecology and behaviour that incriminate them as candidate vertebrate hosts of JEV include: a) they are widespread in many parts of Australia, including areas with JEV activity; b) they regularly migrate, making them potential disseminators of the virus; and c) they have large populations in urban areas of Australia, often in close proximity to mosquitoes.

To determine their role in JEV transmission, in collaboration with colleagues at the Animal Research Institute, Queensland Department of Primary Industries and Fisheries, we exposed Black flying foxes, *Pteropus alecto*, to JEV via either the bites of infected mosquitoes or inoculation. The health of the flying foxes was monitored daily, and weights, temperatures and blood samples obtained at various times post exposure. In addition, to examine whether flying foxes produced a viraemia capable of infecting mosquitoes, recipient mosquitoes were allowed to feed on each of the flying foxes. None of the flying foxes displayed symptoms commensurate with JEV infection. Only one flying fox developed a very low level viraemia. Six out of ten flying foxes exposed to JEV by infected mosquitoes, and 5/5 inoculated flying foxes produced JEV-specific antibodies. Interestingly, four flying foxes transmitted JEV to recipient mosquitoes, despite no detectable viraemia. This was unexpected, as it is generally considered that to act as a vertebrate host, an animal must produce a viraemia level of a certain threshold to infect mosquitoes. We have concluded that, while the infection rate in recipient mosquitoes was relatively low, the large number of individuals present in flying fox camps coupled with their ability to transverse large distances suggest that *P. alecto* could play a role in JEV transmission.

West Nile virus and Australian mosquitoes

West Nile virus was previously known to only in the Old World, occurring in Africa, and the Middle East, with periodic activity in southern Europe and Russia. However, following an unprecedented outbreak in New York in 1999, WNV emerged in the United States resulting in almost 24,000 human cases, and 960 deaths since its introduction. In addition, significant avian and equine mortality has occurred.

Is it possible that WNV could become established in Australia? To answer this question, Cassie Jansen, an Australian Biosecurity Co-operative Research Centre (AB-CRC) for Emerging Infectious Disease funded PhD student, has been studying the potential for local mosquito fauna to be involved in the transmission of WNV. One aspect of this study is to conduct vector competence experiments to determine if Australian mosquitoes can become infected with and transmit a US strain of WNV. Field-collected mosquitoes were exposed to an artificial blood meal containing a known amount of stock virus. After a 12-15 day extrinsic incubation period at 28^{o}C and 75% RH, virus transmission was attempted using an *in vitro* capillary tube system. The results demonstrated that *Culex* spp. were the primary potential vectors of WNV, with infection and transmission rates of over 80% and 50%, respectively, obtained for *Cx. annulirostris*, *Cx. quinquefasciatus* and *Cx. gelidus*. In contrast, *Verrallina* spp., *Anopheles* spp. and *Aedes* spp., were relatively inefficient laboratory vectors of WNV. Thus, Australia appears to have species that could vector WNV if it was introduced from an endemic area. Potential mechanisms of introduction include: a) an infected mosquito in cargo or freight; b) a viraemic animal; or c) a human with a low level viraemia.

The introduction and establishment of *Aedes albopictus* in northern Australia

Aedes albopictus is a container-inhabiting mosquito species, which has expanded its geographical range from its native home of SE Asia into Europe, North and South America and Africa. Despite regularly being intercepted at international ports by the Australia Quarantine Inspection Service, there has

been no evidence to suggest that this species has become established in Australia. However, in 2005, a widespread infestation of *Ae. albopictus* was discovered in the Torres Strait. Entomological surveys have since found *Ae. albopictus* on 12 islands of the Torres Strait. A Commonwealth Government-funded suppression campaign was implemented to reduce the possibility that *Ae. albopictus* be introduced onto the mainland via the numerous flights or freight shipments that originate from the Torres Strait.

Through a AB-CRC funded project, we are investigating the potential factors that could influence the establishment of *Ae. albopictus* as an arbovirus vector in Australia. During container surveys undertaken to elucidate the distribution of *Ae. albopictus* in the Torres Strait and New Guinea, difficulty exists with the morphological separation of *Ae. albopictus* larvae and pupae from other container-inhabiting species (particularly *Ae. scutellaris* and *Ae. katherinensis*). To facilitate the identification of the larvae of container-inhabiting species, Dr Nigel Beebe of the University of Technology, Sydney, developed a polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) procedure that we routinely use for identification of specimens. To further reduce the time between receipt of specimens and identification, we have begun developing real-time PCR assays, which will rapidly identify specimens without the need for post-PCR manipulation. The sensitivity and specificity of these assays is currently being assessed on samples collected from the current known Australian distribution of *Ae. albopictus*.

We are also conducting laboratory-based vector competence experiments with the Torres Strait strain of *Ae. albopictus* for enzootic and exotic arboviruses. Studies conducted by Peter Moore, an Honours student from UQ, demonstrated that *Ae. albopictus* was not very susceptible to infection with dengue virus type 2, with only 7% of individuals developing an infection of the salivary glands. More recently Jay Nicholson, a AB-CRC PhD student, conducted infection experiments examining the susceptibility of *Ae. albopictus* to three arboviruses. While being relatively susceptible to Ross River virus infection, with over 70% of individuals infected, infection rates for both JEV and Murray Valley encephalitis virus were less than 25%.

Overview

Australia is at risk of the introduction of exotic arboviruses, as well exotic mosquito species. Recent examples of this actually occurring include the incursions of JEV into northern Australia and the discovery of established populations of *Ae. albopictus* and *Cx. gelidus*. Our research at Virology, QHSS, focuses on both entomological and virological factors that influence the potential for these viruses and/or vectors to become established in Australia. The outcomes for this research can be used by the relevant authorities to conduct surveillance and implement control activities, such as mosquito control or vaccination.

Vote of Thanks:

Steve Frances gave the vote of thanks for this presentation.

Notice of Next Meeting

Tuesday 12th June 7 pm 2007

Room 388, Goddard Building

University of Queensland,

St Lucia

Student Prize Award

and

Notes & Exhibits

Announcements

NOTICE OF ANNUAL GENERAL MEETING

The next General Meeting of the **Richmond Birdwing Recovery Network** will be held from 12.45 – 3.30 pm on:

FRIDAY 20TH JULY 2007

IN THE LECTURE THEATRE AT CSIRO

QUEENSLAND CENTRE FOR ADVANCED TECHNOLOGIES

2, 643 MOGGILL ROAD, PINJARRA HILLS

The main business will be an address (from 1 – 2 pm)

by

Professor Tim New

Recovery plans for insects: needs, design and implementation

VISITORS ARE WELCOME

This seminar is jointly sponsored by the Queensland National Parks & Wildlife Service and the Richmond Birdwing Recovery Network Inc.

Dear EnSoc Members,

The Entomological Society of Queensland is wishing to publish a member directory including the Name, Address and Email of Society Members. This directory would be distributed to members, and is intended for the use of members ONLY. If you do not wish to have your details included in this directory please let us know before the 15th July by sending an email to the Society: esq@uqconnect.net .

Entomological Society of Queensland

People & Projects

Entomological Notes

"Butterfly and Dragonfly" Phd Request

Dear Butterfly and Dragonfly Enthusiast,

I have just started my PhD at Macquarie University with Professor Lesley Hughes, I am planning to investigate whether Australian Lepidoptera and Odonata are responding to climate change by shifting their ranges southwards. I am trying to collate information about east coast species, specifically range data and flight dates, and I am wondering if you or any or your members may be able to help. I have already got data from the Dunn and Dunn data base for butterflies and ANIC for dragonflies, but I am hoping that there is more information and more records out there that have not been digitized.

I have listed the butterflies and dragonflies I am interested in below, if anyone can offer any information (such as they are impossible to catch or identify as well as range data points) I will be grateful to receive it.

Thank you.

Yours sincerely,

Kath McClellan

Butterflies: **Order**: Lepidoptera

Superfamily: Papilionoidea

Family	**Subfamily**	**Species**
Hesperiidae	Coeliadinae	*Hasora khoda*
	Trapezitinae	*Trapezites phigalioides*
	Trapezitinae	*Trapezites iacchoides*
	Trapezitinae	*Anisynta tillyardi*

Butterflies list *cont...*

Family	Subfamily	Species
Pieridae	Pierinae	*Elodina angulipennis*
Nymphalidae	Satyrinae	*Hypocysta euphemia*
	Satyrinae	*Heteronympha mirifica*
	Nymphalinae	*Doleschallia bisaltide*
Lycaenidae	Theclinae	*Paralucia spinifera*
	Theclinae	*Hypochrysops epicurus*
	Theclinae	*Ogyris barnardi*
	Polyommatinae	*Prosotas felderi*

Dragonflies: **Order**: Odonata

Suborder: Anisoptera

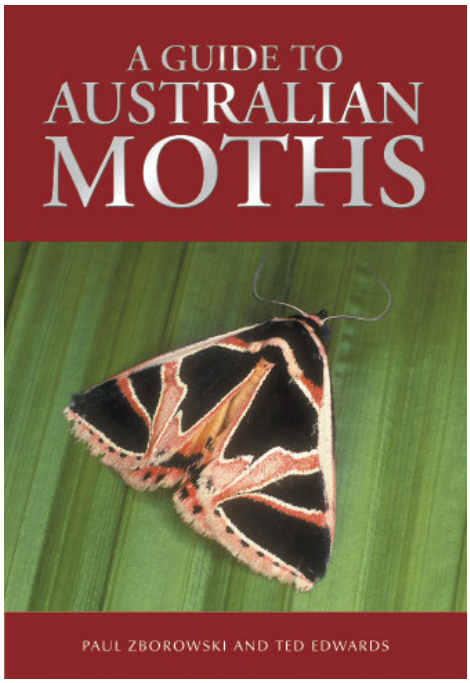
Superfamily	Family	Species
Libelluloidea	Libellulidae	*Agrionoptera longitudinalis biserialis*
		Agrionoptera insignis allogenes
		Orthetrum boumiera
		Orthetrum serapia
		Orthetrum villosovittatum
		Potamarcha congener
		Rhyothemis princeps
		Rhyothemis resplendens
		Tetrathemis irregularis cladophila
		Zyxomma petiolatum
	Austrocorduliidae	*Austrophya mystica*
		Micomidia atrifrons
	Gomphomacromiidae	*Archaeophya adamsi*
		Archaeophya magnifica

Dragonflies list *cont...*

Superfamily	Family	Species
Libelluloidea	Hemicorduliidae	*Hemicordulia superba*
		Hemicordulia continentalis
	Macromiidae	*Macromia tillyardi*
	Synthemistidae	*Choristhemis flavoterminata*
		Eusynthemis nigra

New Book Release

A Guide to Australian Moths



Paul Zborowski

Ted Edwards

Colour photographs, Illustrations

224 pages, 210 x 148 mm

Publisher: CSIRO PUBLISHING
Publication date: May 2007

Paperback - ISBN: 9780643091597 - AU $39.95

http://www.publish.csiro.au/pid/5571.htm

Description

Moths are often thought of as the ugly cousins of butterflies, yet their colours can be just as remarkable and, with over 20,000 species in Australia, their biology and lifestyles are far more diverse.

Entomological Society of Queensland

With striking colour photographs of live moths in their natural habitat, this guide illustrates all the major moth families in Australia, including some rarely seen species. It provides many curious facts about the unusual aspects of moth biology, including details on day-flying species, camouflage, moths that mimic wasps, larvae with stinging hairs, and larvae that have gills. This easy-to-read book includes sections on the iconic Witjuti grubs, Bogong moths, the giant-tailed Hercules moths of northern Queensland (one of the largest moths in the world, with a wingspan of over 25 cm), moths that release hydrocyanic acid in their defence, and moths that produce ultrasonic calls that bats learn to associate with a bad taste.

A Guide to Australian Moths highlights the environmental role of moths, their relationships with other animals and plants, and their importance to humans. It provides a unique introduction to the extraordinary diversity of moths found in Australia.

Features

- The first well-illustrated guide to Australian moths aimed at a general readership
- Treats all 82 families of Australian moths
- Provides an introduction to moth biology and camouflage
- Copiously illustrated with high quality photographs

Author Information

Paul Zborowski is a qualified entomologist and photographer with over 25 years experience of field based study of insects and related creatures in habitats all over the world's tropics. He is the published author of a number of insect reference works including the Whitley Award winning *Field Guide to Insects of Australia*. He has a vast photo library of insect images, which he has built up over 30 years.

Ted Edwards worked on Australian moths for more than 30 years at CSIRO's Australian National Insect Collection (ANIC) in Canberra. He has published widely in the fields of insect classification, nomenclature, biology, behaviour, collecting and handling.

Eric James Reye, 1920 to 2007

Medical practitioner and pioneer of Australian biting midge research and control.

Eric James Reye, a longstanding and honorary life member of our society, was born in Brisbane on May 12th, 1920, the eldest of three boys and two girls. His mother was a nurse, and father a West Brisbane G.P. (1860 graduate of the University of Sydney, as there was then no medical degree course in Queensland).

Eric went to school at the exclusive Brisbane Church of England Grammar School ("Churchie") and in the family tradition went on to do a medical degree, graduating in 1943 from The University of Queensland.

After his hospital internship, he worked as the Government Medical Officer at Moreton Bay's Peel Island Leprosarium (1946 to 1949) with Hansen's Disease (Leprosy) patients, where he trialled and subsequently delivered the first effective treatment (Dapsone) for Hansen's Disease, the success of which resulted in full control of the spirochaetal disease and eventual closure of the Peel Island facility.

If Eric had not taken on the Peel Island position he may never have worked on the group of insects – biting midges – that he subsequently became interested in and authoritative on. While on the island he could not help but become aware of the nuisance value of biting midges (generally lumped as "sandflies"). He discovered that little was known about their taxonomy and biology and resolved to find out more about them.

After Peel Island, Eric worked irregularly in medicine doing some G.P. locums and some government jobs as he needed the income. From 1952 to 1963 Eric collaborated with Professor David Lee of Sydney University's School of Public Health and Tropical Medicine and Alan Dyce of the CSIRO's Division of Animal Health at Glebe in Sydney. This resulted in the publication of five taxonomic papers on *Culicoides* species (Ceratopogonidae), the dominant pest genus of biting midges in Australia and

the Pacific. In all, Lee and Reye described twenty-six species of *Culicoides,* three of which were synonymised (Appendix B). Several were dedicated to colleagues and co-workers, e.g. *C. mackerrasi, C. dycei, C. marksi*, etc.

For about three decades until the mid-eighties, Eric held a supernumerary research position at The University of Queensland's Entomology Department, accommodated in a room adjacent to that of his "mosquito" colleague, the late Dr E.N. (Pat) Marks. Unlike Pat, who had continuous governmental funding, Eric sustained himself by falling back on his primary profession – "pills and patients" paid his way! It appeared that there was always money for mosquito research but never enough for midges! It is appealing to conjecture that this may have been partly due to the absence (in those days- but now see below) of the serious pest species in Brisbane!

Reluctantly at first, Eric began to write research reports, as formally published co-authored papers and departmental memos which the university published as a series of bulletins - Biting Midge Information Services. These bulletins were distributed to research institutions, government departments and local authorities. It is quite likely that the fledgling Queensland Institute of Medical Research played a supportive role in this undertaking. Eric continued these reports into the early 90's with contributions to the Bulletins of the Australian Mosquito Control Association (now published as "Mossie Bites"). In 1977 he was awarded a Postgraduate Certificate in Parasitology from The University of Queensland.

Eric's original work on the biology of pest species was fascinating and important, particularly in relation to understanding life history aspects that could be used in implementation of control measures. In particular, his elucidation of different substrate breeding sites for different species allowed for better mapping of their distributions. For example, he showed that the major pest species generally preferred brackish or saline water habitats. He fine tuned this with more detailed species observations e.g. *C. subimmaculatus* Lee & Reye whose larvae are associated with surface tunnelling *Mictyris* crabs; *C. molestus* Skuse, whose larvae live in almost pure intertidal sand, and *C. brevitarsis* Kieffer, which is associated with wet cow dung (Cannon and Reye 1966).

Importantly, Eric also noted the influence of the tide cycle on certain species of *Culicoides* (Reye and Lee 1963) and with Doug Kettle and Alan Dyce a new distribution of at least one pest species, *C. molestus* Skuse, into man-made canal estates in southeast Queensland (Kettle, Reye and Edwards 1979).

His last taxonomic paper described a minor pest species (*C. longior*), present in southeast Queensland but confused with its northern congener, the notorious pest species *C. ornatus* Taylor (Hagan and Reye 1986). The importance of that paper was realised in 2004 when *C. ornatus* was found along the Brisbane River - a southward expansion of about 210 km (Muller 2006).

Perhaps the most important aspect of Eric's research work was in relation to the potential of biting midges as vectors of disease in humans and animals (Lee, Reye and Dyce 1963). Ceratopogonids were responsible for transmitting the arbovirus that causes Blue Tongue disease in sheep and Akabane disease in cattle, and were suspected vectors for Bovine Ephemeral Fever and Myxomatosis. The main effect on humans from biting midges is discomfort from the bites, although in some individuals there occurs a severe local allergic reaction requiring control with topical, oral and occasionally parenteral steroid drugs (Reye 1964).

Although most of Eric's published works related to the pest species of biting midges he occasionally published more broadly. For example, Lee and Reye (1955) was a general monograph on the genera *Alluadomyia, Ceratopogon, Culicoides* and *Lasiohelea.* Eric also contributed a section on common Queensland biting midges to Pat Marks' 1982 Atlas of Common Queensland Mosquitoes. Probably his final paper on biting midges was a synopsis of the common pest species in a 1992 Bulletin of the Mosquito Control Association of Australia (Reye 1992).

Eric showed much ingenuity in his quest for specimens of all stages of his subjects. He designed several efficient light traps to which large numbers of adult *Culicoides* and other dipterans were attracted. He also invented other miscellaneous collecting and sorting equipment, including an egg extraction unit for the collection of midge eggs from sand.

He amassed a huge collection of specimens, probably many more than he was capable of sorting, cataloguing and describing in his lifetime. His departmental office began to bulge with a clutter of both assorted and unworked material (G.Monteith, D.Kettle pers comm.). Holotypes of the Lee & Reye described species are in the ANIC but the bulk of his specimens are now incorporated in the James Cook University collections under the stewardship of Anton Briedl.

When he was away from the department, Eric quite likely would be found sailing on Moreton Bay. He had two boats: a small sailing dinghy and a substantial yacht that he more or less lived on whilst working on Peel Island and which became his home at the end of his second marriage. His yacht (M.V. COOLOOLOA) was virtually moored permanently at Redland Bay and he became quite a well-known although somewhat reclusive local identity!

After his graduation, Eric and Marjorie Grice were married for a short time, with no children. He met his second wife Margaret Wilson (a technical assistant at the Queensland Museum) whilst working within the Entomology Department. They had two children, a daughter (Penelope) who died tragically at a young age in Indonesia, and a son (Tim) who also studied medicine and until recently worked as a G.P. in Toowoomba. His long time partner in his last years was Jeannine Lamy, whom he met while taking French lessons at the University of Queensland.

Eric died peacefully, aged 86, in a nursing home at Beenleigh QLD, on 29th January 2007.

As Tweed Shire Council Environmental Health Officer Clive Easton wrote: "Eric Reye belonged to that diminishing group of altruistic and dedicated old-school naturalist/scientists, willing to spend a lifetime expanding knowledge on their subject. His midge collections and many writings have enlarged our understanding of the Australasian biting midge fauna. I have strong memories of the old fellow greeting me with a wry grin, eyeglasses held together with masking tape, puffing away on his beloved pipe, eagerly ready to tell a story

of another part in the midge puzzle he felt he was near solving. No one is replacing these old gentlemen and the world is a poorer place without them".

Acknowledgements

On compiling these biographical notes I especially wish to thank the following: Harry Standfast for ferreting out details of publications, providing photos and useful comments; Clive Easton for recollections and photographs; Peter Ludlow for photographs; Edward Reye for some details of family history; Margaret Schneider, Doug Kettle and Geoff Monteith for some anecdotal information; Anna Marcora for kindly offering to type the manuscript.

John T.St.L. Moss.

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Reye, E.J. and Lee, D.J. (1963) The influence of the tide cycle on certain species of *Culicoides* (Diptera: Ceratopogonidae). *Proc. Linn. Soc. NSW* 87: 377-387.

Reye, E.J. (1964) The problems of biting midges (Diptera: Ceratopogonidae) in Queensland. *J. ent. Soc. Qld.* 3: 1-6.

Reye, E.J. (1992) The Common Pest Species of Biting Midges. *Bulletin of the Mosquito Control Association of Australia* 4(3): 6-14.

Appendix A (compiled by Harry Standfast)

Summary of scientific publications by E.J. Reye.

- Lee, D.J. and Reye, E.J. 1953-1963, 5 taxonomic papers in *Proc. Linn. Soc. NSW.*
- Reye, E.J. and Lee, D.J. 1961-1963, 2 papers in *Proc. Linn. Soc. NSW.*
- Hagan, C.E. and Reye, E.J. in *J. Aust. ent. Soc.* 1986, description of *Culicoides longior* and a redescription of *C. ornatus* Taylor.
- Reye, E.J. 1964-1976, 23 contributions to *J. ent. Soc. Qld., News Bulletin Ent. Soc. Qld., Qld. Nat & Ceratopogonimid Information Exchange.*
- Reye, E.J. 1953-1976, 40 reports to University of Queensland Entomology Department and *Ent. Soc. Qld.* minutes.
- Reye, E.J. 1991-1993, 11 contributions to the Bulletins of the Australian Mosquito Control Association Inc. These most useful papers dealt with midge biology and with techniques for collecting midges and mapping their breeding sites.

Appendix B

List of taxa (order Diptera, superfamily Chironomoidea, family Ceratopogonidae, genus *Culicoides*) described by D.J. Lee and E.J. Reye in the Proceedings of the Linnean Society of N.S.W. over the period of 1953 to 1963, including redescriptions (in alphabetical order):

C. angularis, C. austropalpalis, C. bundyensis, C. bunrooensis, C. dycei, C. fulbrighti, C. henryi, C. hornsbyensis, C. immaculatus, C. interrogatus, C. leanderensis, C. mackayensis (=C. histrio Johannsen*), C. mackerrasi, C. magnimaculatus (=C. victoriae* Macfie*), C. marginalis, C. marksi, C. moreensis, C. mykytowyczi, C. narrabeensis, C. nattaiensis, C. parvimaculatus, C. purus, C. robertsi (=C. brevitarsis* Kieffer*), C. subimmaculatus, C. waringi, C. williwilli.*

Described by C.E. Hagan and E.J. Reye (1986) in the Journal of the Australian Entomological Society (vol 25 pt 4):
C. longior (with a redescription of *C. ornatus* Taylor).

1. Eric Reye with midge trap on the Gold Coast – circa 1972
2. E J Reye ESQ Jubilee 1974

DIARY DATES 2007

Meetings held 2nd Monday of the month (or Tuesday if Monday is a Public holiday)

June 12th	Student award, Notes & Exhibits	
August 13th	Nancy Schellhorn	
September 10th	David Merritt	
October 8th	Steve Barker	Why are there so many head lice, *Pediculus capitis*?".
November 12th	Andrew Austin (Perkins Memorial lecture)	
December 10th	Notes & Exhibits	

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NOTICE OF NEXT MEETING

The next meeting of the Society will be held at 7:00 pm on **Tuesday**, 12th June at Room 388, GODDARD Building, University of Qld. The main business will be **Student Prize Award, Notes and Exhibits**. Refreshments will be served before the meeting at 6:30 pm in the tea room, Level 2 of the Goddard Building (to the right of the main stairs), with a gold coin donation required. No donation is required to attend the talk alone.

VISITORS ARE WELCOME

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