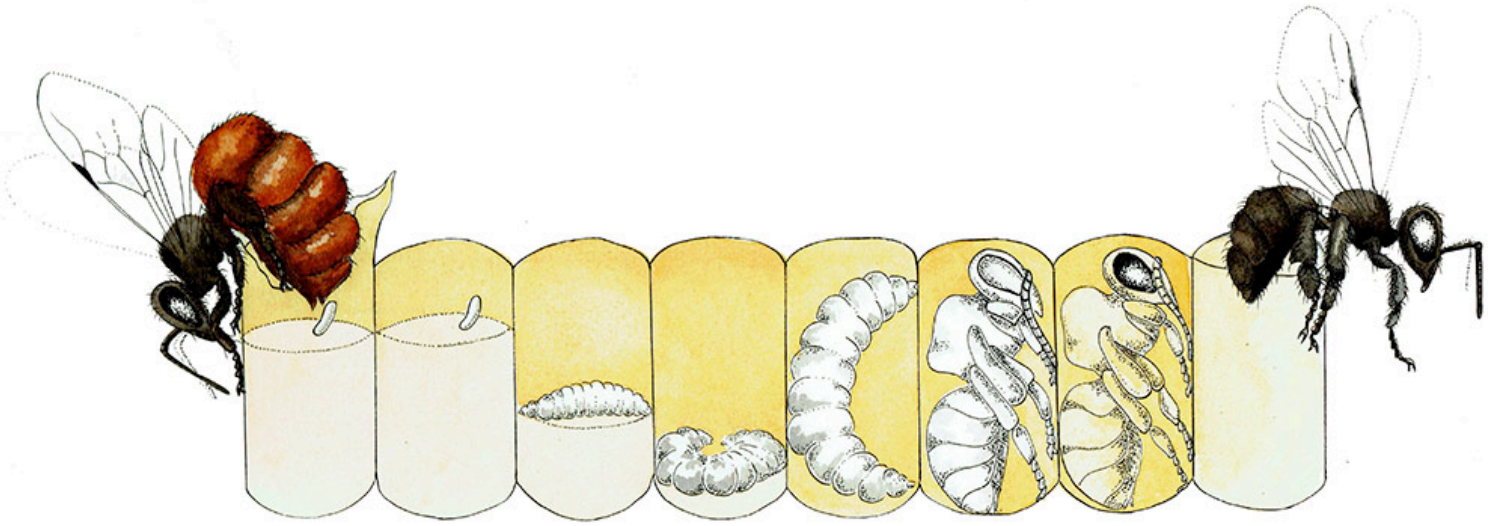
Entomological Society of Queensland

NEWS BULLETIN



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Entomological Society of Queensland

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Front Cover Illustration: This illustration by Gina Cranson represents a cross-section through the brood comb of a generic stingless bee showing the process of rearing brood. A cell is mass provisioned by nurse workers before the queen lays an egg. The cell is then immediately capped so that the larva can develop in a closed cell. This resembles the ancestral nesting behaviour of the solitary bees, which also cap cells immediately after provisioning and laying an egg, and not the highly-derived behaviour of honey bees which progressively provision their larvae.

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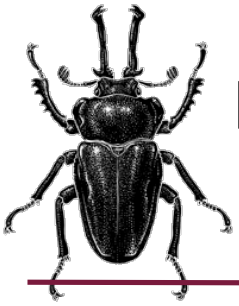

Entomological Society of Queensland

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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, particularly in Queensland. 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 on the second Tuesday 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. Membership is open to anyone interested in Entomology.
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 (Coleoptera). Its magnificent purple and green colouration makes it one of the most attractive beetle species in Australia. Other common names include Rainbow, Golden and Magnificent Stag Beetle. It is restricted to the rainforests of northern Queensland.

Entomological Society of Queensland
Minutes for General Meeting

Tuesday, May 9th, 2017
Held in the Seminar Room, Ecosciences Precinct, Boggo Rd, Dutton Park.
Meeting open: 1:05pm

Attendance (39):

Members (32): Brogan Amos, William Arnold**,** Mike Barnett, Bradley Brown, Shannon Close, Michael Day, Kathy Ebert, Desmond Foley, Graham Forbes, Stephen Frances, Andrew Hayes, Tim Heard, Bobbie Hitchcock, David Holdom, Andrew Hulthen, Peter James, Lachlan Jones, Chris Lambkin, Lui Lawrence-Rangger, Simon Lawson, Kempsy Ledger, Lance Maddock, Andrew Maynard, Penny Mills, Geoff Monteith, Leanne Nelson, Cate Paull, Brenton Peters, Muthuthantri Saku, Don Sands, Martin Shivas, Tara Wheatland

Visitors (7): Teshale Degefla, Colleen Foelz, Jan Kraut, Leila Matindoost, Julian Pleibe-Palamino, Tim Page, Henry Zhuang

Apologies: Julianne Farrell, Morris C. McKee, Noel Starick, Richard Zietek

Minutes: The minutes of the last meeting were circulated in News Bulletin 45[2] April 2017. Moved the minutes be accepted as a true record: Cate Paul; Seconded: Christine Lambkin
Carried: all

Nominations for membership approved by council:

None this month.

General Business:
Tim Heard advised attending members that a Brisbane airport quarantine facility tour was scheduled for Tuesday 18 July 2017. He also encouraged members to present items for next month's '*Notes and Exhibits*'. *Notes and Exhibits* are short presentations on any subject of interest, ranging from a 5 minute update on your research project to a photo of an interesting insect. Contact Tim if you have something you would like to share!

Main Business:

Mike Muller, our new Vice President, gave an interesting presentation on the historical and current mosquito management programs in Brisbane entitled "Mosquito management in Brisbane". Tim Heard provided a vote of thanks.

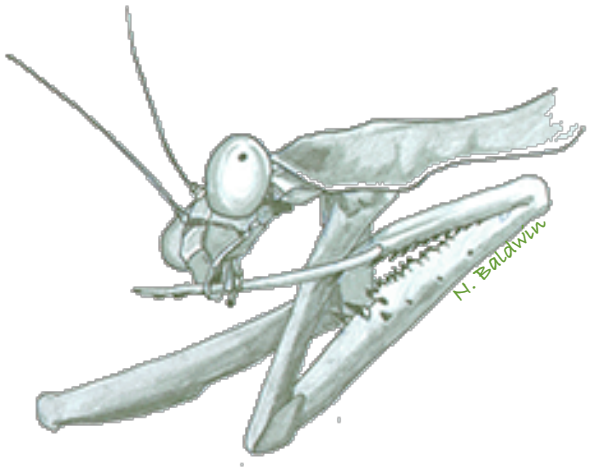
Next meeting: The next meeting will be on the 13th of June. This will be a Notes and Exhibits meeting. Members are welcome to give a short presentation or present an exhibit. Contact Tim Heard for more information or to register your interest.

Meeting closed: 13:58

Bee fly (Bombyliidae) in a Taringa backyard. Photo: Will Arnold

At our next meeting...

Notes & Exhibits!!



This is a more informal meeting where we have a variety of short presentations. Anyone is welcome to share.

Come and see:

Dr Andrew Walker from the University of Queensland will talk about recent research into *"Insect venoms"*.

Lachlan Jones, PhD student from the University of Queensland will give an overview of his research project *"The preference-performance hypothesis in herbivorous insects"*.

"*The more you look the more you find....*" a recount of the recent Bush Blitz to Cape York

Plus more.... any one is welcome to present a short 5-10 minute informal talk or demonstration or present an exhibit!

Contact Tim Heard if you have something you would like to share at tim@sugarbag.net

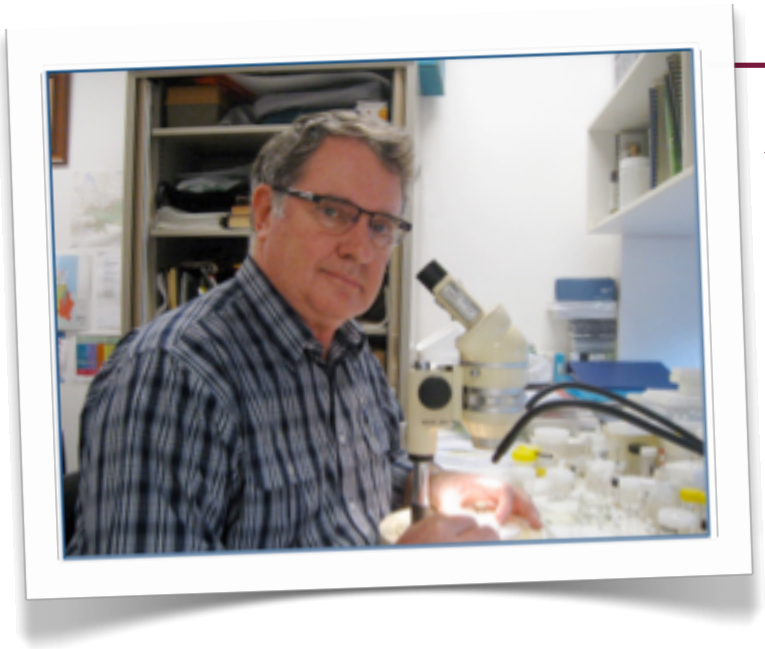
Tuesday, June 13th at 1pm, Seminar Room at EcoSciences. Tea & coffee following. All welcome!

A unique opportunity to visit the Department of Agriculture and Water Resource's biosecurity laboratory at Brisbane airport!

Date & Time: 18 July 2017, 4pm

The Australian Government Department of Agriculture and Water Resource's Operational Science Services (OSS) operates a biosecurity laboratory at Brisbane airport. The OSS group contributes to the Department's biosecurity objectives through diagnosing intercepted pests (invertebrates, plant diseases and plants/seeds) and providing biosecurity risk mitigation advice and training to biosecurity officers. Bill Crowe and Tony Robinson have offered members of the ESQ a unique opportunity to view this facility and hear about its valuable work.

Numbers limited. Contact Mark Schutze to register an expression of interest.
Mark.Schutze@daf.qld.gov.au



Mosquito management in Brisbane: past, present and future

presented by Mike Muller

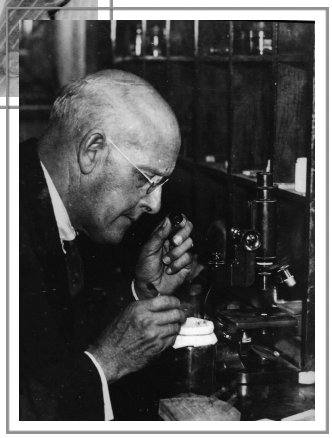
Senior Medical Entomologist,
Brisbane City Council Mosquito Management

(This report draws heavily on my article published in 2006, Australian Entomologist ***33*** *(4): 193-202, in the proceedings of a Symposium to commemorate Dr Elizabeth (Pat) Marks. Much of the following early history is taken from an address by J D Mabbett, then Chief Health Officer of Brisbane City Council, to a meeting of the Entomological Society of Queensland on 14 November, 1960).*

In 1912, the Queensland Commissioner of Public Health, Dr J.S.C. Elkington, arranged a preliminary mosquito survey in Brisbane and suburbs under Lance Cooling. This led to the first mosquito regulations in the same year, but by 1921, the only organised activity was oiling of gully traps in parts of Brisbane, South Brisbane, Toombul and Toowong. In 1921, the "Mosquito Prevention and Destruction Regulations" were introduced to control *Aedes aegypti* (Linnaeus). Cooling was urging local authorities to provide permanent means of foul water drainage to control *Culex fatigans* Wiedemann (now known as *Culex quinquefasciatus* Say). This species was the known vector of filariasis, which was common in Brisbane at the time.

Lance Cooling, Brisbane Mosquito Survey

When Greater Brisbane was established as a single Council in 1925, the Medical Officer Dr Tilling arranged faster coverage of gully traps by providing a horse and buggy. In 1928, the Council appointed Dr Ronald Hamlyn-Harris as City Entomologist in response to concern about mosquito control. Staff comprised a supervisor, four mosquito locaters and four sprayers. In 1932, the section was using three tricycles to speed up treatment of gully traps, and in 1934, three motorcycle units were introduced. The program targeted mosquito larvae, and larvacides in use were various oils and kerosene mixtures.



Dr. Ronald Hamlyn-Harris, Brisbane City Entomologist, 1928

The impact of the Second World War on interest in mosquitoes in Australia was very significant, due to concerns about malaria in the South Pacific and Southeast Asia, and the possibility of returning soldiers bringing malaria parasites home. There was also a serious epidemic of malaria in Cairns in 1942. After the war, many ex-servicemen with war-time experience in pest control were employed by Brisbane City

Oil equipment used against mosquito larvae. Brisbane City Council, date unknown.

Council. Many of these men would have been trained during the war in courses run at the University of Queensland by F. Athol Perkins of the University of Queensland Entomology Department, with Elizabeth (Pat) Marks as their instructor. In the three years following the war, a complete re-survey of mosquitoes in Brisbane was undertaken, with particular attention paid to *Anopheles* mosquitoes because of the malaria issue. Larvacides in use after the war included DDT and malariol.

In 1949, Brisbane was divided into ten zones with men and motor cycle units designated to these areas. Gully traps were also covered in a separate control schedule. In 1950, Council purchased its first truck-mounted, thermal-fogging machine for adult mosquito control, and by 1960 there were four of these units. However, control of mosquito larvae was still the main task of the program. One product used successfully for this was "Larvabane", based on benzene hexachloride, claimed to be "very toxic to mosquito life but safe to beneficial fish life". During the 1950s, "house to house inspections and remedial action" led to the virtual elimination of *Aedes aegypti* (Linnaeus) and the claim that "Dengue has been beaten". (There had been an outbreak of dengue in Brisbane in 1905 that was reported to have incapacitated one third of the work force and caused many fatalities, and there were other outbreaks up to and including the 1940s).

In the 1950s, *Culex annulirostris* Skuse took the place of *Cx. fatigans* (*Cx. quinquefasciatus*) as drainage and sanitation improved. This change also coincided with the disappearance of filariasis carried by *Cx. fatigans (Cx. quinquefasciatus*). However, the major pest mosquito at the time was the "migratory black swamp mosquito *Aedes vigilax* (Skuse)".

In 1964, the Brisbane City Council mosquito control group had a permanent staff of 50 and was spending £80,000 annually on control of *Cx. fatigans* (*Cx.*

The Brisbane City Council Mosquito Team, 1959.

City Hall 1960, during National Health Week: "Demonstration of Modern Pest Control Equipment Used by Department of Health Brisbane City Council". J D Mabbett is on the steps.

The Brisbane City Council Mosquito Control Bike Team, 1980s.

quinquefasciatus) in man-made polluted sites. An aerial survey had been conducted from the Mooloolah River to the Tweed River to identify potential saltmarsh breeding sites. For saltmarsh mosquitoes, the Chief Health Officer J. D. (Doug) Mabbett was advocating a combination of land reclamation, and an overarching Moreton Bay Regional Control Mosquito Abatement District for all Local Authorities and the State Government to operate on a joint basis. This initiative was pursued vigorously by a range of pre-eminent mosquito workers including Pat Marks, Harry Standfast at Queensland Institute of Medical Research, (QIMR), Professor Douglas Kettle at the University of Queensland and a number of local government bodies. However, the State government of the day rejected the proposal out of hand. Keith Ferguson of the Gold Coast City Council, tiring of government inaction, established the Contiguous Local Authorities Group (CLAG) in 1968. This group included Gold Coast, Logan, Redland and Albert cities and shires in Queensland, and Tweed Shire in New South Wales. CLAG is still functioning and was the forerunner to other successful groups in Southeast Queensland that are operating today.

One interesting exercise associated with *Ae. vigilax* on 6 March 1964 was a fogging exercise around Bulwer Island on the north bank of the Brisbane River at Pinkenba. On that afternoon, Her Majesty Queen Elizabeth II was scheduled to unveil a Memorial Cairn at an oil refinery to mark the discovery of oil in Queensland. The cairn and the royal pavilion erected for the occasion were within 30 metres of mangroves where prolific numbers of *Ae. vigilax* were resting. The workmen erecting the pavilion had complained of constant attack by both mosquitoes and March Flies. On the day of the function, commencing early in the morning, vehicle mounted and hand held fogging equipment was used to apply "knockdown and residual formulations" around and through the adjacent mangroves. The last of these applications in the two hours before the ceremony also included the repellent diethyl toluamide (DEET). All of this produced "highly favourable results" and "the function was held without insect nuisance". Mabbett submitted a Note on this operation that was published in the American journal Mosquito News. The Editor commented that "There are several points and expressions in this article that may not be entirely clear to readers in other parts of the world, but it is so seldom that we hear from Australia, and the operations described are so interesting, with many useful hints, that it seemed worthwhile to print the account more or less as received".

Mabbett was opposed "in principle" to aerial control of mosquitoes because of its "hit and miss" nature and potential non-target impacts. However, in 1970 the Council of the day went ahead with a trial of an aerial application of Dibrom, an organophosphate insecticide, aimed at adult *Ae. vigilax* resting in mangroves in the Cribb Island area. A number of scientists, including Harry Standfast, Pat Marks and Geoff Monteith had spoken out against the trial in its planning stages, labelling it as haphazard. On 17 January, the trial went ahead and the resultant fish kill was featured in the Sunday Mail the following day, with entomologist Geoff Monteith pictured holding a handful of small, dead fish.

However, efforts to establish aerial control of saltmarsh mosquitoes continued, with the target being larvae rather than adult mosquitoes. This was pioneered in the early 1970s on the Gold Coast by Brian Kay of QIMR, Keith Ferguson of Gold Coast City Council and Dick Morgan of Cyanamid. The product used was a sand grain organophosphate formulation called Abate with the active ingredient temephos, a larvicide applied into saltmarsh pools by biplanes. By 1976, an aerial program was operating in Brisbane. Abate was the mainstay of the aerial program until the early 1990s, with helicopters replacing fixed wing aircraft in the mid-1980s. A liquid formulation of Abate was also used by ground staff to target mosquito larvae in both freshwater and saltmarsh pools. Motor cycles with sidecars were a regular feature of the program

Using a remote-rewind hose unit to treat freshwater mosquito breeding with Bti in Pinkenba.

through the 1970s and 1980s, with the last operator (and sidecar bike) retiring in 1997.

In the early to mid-1990s, laboratory studies using Abate determined that it was potentially harmful to juvenile crustaceans. Bench-top susceptibility tests also revealed that *Ae. vigilax* was developing resistance to this product. It was quite fortuitous that at this time, two alternative products became available. These were the bacterial protein Bti and the growth regulator S-methoprene. Both products have excellent selectivity for mosquito larvae and are very safe for invertebrate and vertebrate non-target animals.

Bti is produced in a fermentation process by the naturally occurring soil bacteria *Bacillus thuringiensis* var *israelensis* de Barjac. The active ingredient is a crystalline protein of approximately ten microns in length that must be eaten by mosquito larvae to have its effect. In the alkaline pH of the larval gut, the crystal breaks down and releases proteins that disrupt the cells of the gut wall and cause the death of the larva, usually within 24 hours. Bti is available in liquid, powder and granular formulations.

A quad bike spraying Bti on saltmarsh mosquito pools in Tinchi Tamba Wetlands.

S-methoprene growth regulator interferes with the moulting process that occurs with transition between larval stages and between the final larval stage and the pupa. It can prolong the larval stage indefinitely, and cause high levels of pupal mortality or failed adult emergence. S-methoprene is available as a liquid, in a sand base, and in slow-release charcoal matrix pellets and briquets.

These products have become the mainstays of mosquito management in Brisbane City Council since 1994. They are used for aerial application from helicopters in saltmarsh areas, and by ground-based staff from four-wheel drive

Aedes vigilax saltmarsh mosquito larvae from Tinchi Tamba Wetlands in a tidal drain four days post treatment with S-methoprene.

utilities and quad bikes. The capacity to carry out adult mosquito control using fogging or ultra-low volume misting is maintained, but is rarely used.

Currently, for mosquito management in Brisbane City Council there is a Technical Group with two Medical Entomologists and two Technical Officers, and approximately 18 field staff with a fleet of 4WD trucks and quad bikes fitted with pumps and sprays. The unit has an annual budget of approximately $3.5 million. The aerial program each year plans to cover up to 20,000 hectares of saltmarsh in a season from August to May, usually in approximately 16 separate treatments. However, both the total area and the timing can vary with seasonal conditions. Differential Global Positioning Systems are now used routinely in the aerial program, and spray flight paths are overlayed on aerial photographs for every treatment. DGPS is also being used more frequently in ground-based management.

For the latter, Brisbane City is divided into thirteen different sections (eleven for trucks and two for quad bikes) and a total of approximately 2,600 known and potential mosquito breeding sites on public land are listed and spread over separate databases for each of those sections. The databases include sites such as roadside drains, parks and reserves, and information on the tide heights and rainfall triggers that can initiate mosquito breeding at those sites. The target is to check and treat them in a logical order at intervals short enough to prevent mosquitoes from completing their life cycle.

There will be further challenges in the future. In Southeast Queensland, there are significant pressures on development and infrastructure in coastal areas, due to the steady influx of new residents from southern states. Many of these will move into the "pest range" of saltmarsh mosquitoes in their desire to live adjacent to the coast. And many of the new real estate developments are incorporating what is known as "Water Sensitive

Aedes vigilax saltmarsh mosquito larvae from Boondall Wetlands near Nudgee Road.

A Bell 206 Longranger helicopter applying Bti to saltmarsh pools in Tinchi Tamba Wetlands.

Urban Design" for management of storm water run-off. These features are initially designed to be free of mosquito breeding, but based on experience elsewhere, there are likely to be potential issues with maintenance of these drains in the future.

It was the destruction of water tanks and improvements in reticulation that led to the disappearance of the dengue vector *Ae. aegypti* from Brisbane in the 1950s. Currently this species occurs in North and Central Queensland, as far south as Gladstone and the Burnett region. A major challenge for the future is to prevent the re-establishment of this species in Brisbane. The drought of the early to mid-2000s led to the introduction of water restrictions and a proliferation of rainwater tanks. At the same time residents also were storing water in a variety of containers and there were real concerns that this provided opportunity for container-breeding mosquitoes to thrive. While modern plastic water tanks certainly have better mosquito-proofing than the old corrugated iron variety, there may be issues with their maintenance in the future that will need to be monitored, such as cracking and crazing plastic as the tanks age. Surveys by Council Officers and staff from QIMR found there was fertile territory for mosquitoes in backyards and private premises across the city.

Aedes aegypti is not the only future threat to Brisbane. Of even greater concern is the Asian Tiger Mosquito, *Ae. albopictus* (Skuse). This container-breeding species is a nasty day-time biting pest and considered to be one of the most invasive animals on the planet. It is currently found on some of the Torres Strait islands but not on the Australian mainland. However over the last 30 – 40 years it has invaded the Southeast quarter of the USA and is now spreading through Mediterranean Europe. Both these species can carry dengue viruses, and will also carry chikungunya and Zika viruses, both of which can cause severe clinical symptoms in people. The sudden eruption of both these viruses, particularly in South and Central America just in the last few years, is a salient example of how exotic diseases and vectors can come "out of left field". Both of these mosquito species have been detected by quarantine authorities at capital city airports and seaports in recent years, but neither has become established.

Increasing awareness of such threats has led to strong collaboration between Queensland Health and Brisbane City Council, as well as other local government groups, to monitor for early detection of exotic mosquito introductions. As these species lay their eggs on damp surfaces in containers, traps incorporating damp cloth strips are set in a network of sites across the city and the cloth strips are harvested at regular intervals. Mosquito eggs on

these strips are then processed using molecular fingerprinting techniques to test for the presence of exotic species among the native container breeding species. The technique is sensitive enough to detect one exotic specimen in a background of 5,000 native specimens.

Similar technology is also being used in further collaboration with Queensland Health to monitor for the presence of native arboviruses such as Ross River virus and Barmah Forest virus. Brisbane City Council operates ten mosquito traps across the city each week to monitor mosquito populations within and between seasons. At appropriate times of the season, the trap containers hold specialised cards that have been soaked with honey to induce trapped mosquitoes to feed. If any mosquitoes are transmitting virus, it will be captured on the card. These cards are processed using molecular technology that will detect the virus and results are available within 24 hours of processing. This provides much earlier warning of virus activity than the delay involved when someone is infected by a mosquito bite, becomes ill enough to visit the doctor and have a blood test to confirm a diagnosis. That early warning can lead to public health warnings of virus activity and advice to residents on minimisation of exposure to mosquito bites, as well as targeted mosquito management.

Modern mosquito management has become far more sophisticated and has excellent products and equipment available. New molecular technology is now playing a significant part in mosquito-borne disease detection and will play an increasing part in mosquito taxonomy. There is now a much clearer recognition that mosquito management programs are carried out in environmentally sensitive and important habitats that require significant duty of care. However, the challenges of knowing the biology and distribution of pest species, and of dealing with them in a variety of seasonal conditions, are still very similar to those faced in earlier times. The one constant in mosquito management is that the target insects are so brilliantly adapted to taking advantage of any ecological niche they find in nature. Skills and experience of mosquito management operators are an essential ingredient of keeping these pests under control. They will be necessary along with ongoing scientific studies to keep mosquito pests and mosquito-borne disease at bay into the future.

Acknowledgments

This paper could not have been prepared without the accurate recording of the address by J D Mabbett to the Entomological Society of Queensland on 14 November 1960, and provision of those Minutes for me by Dr Geoff Monteith.

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Aedes vigilax. Photo: Queensland Museum

Visit of Copenhagen staphylinid team

During March-April a 3-man crew of researchers from the Natural History Museum of Denmark in Copenhagen visited Queensland to make field collections and study museum collections of the beetle family Staphylinidae (Fig 1). They were led by Alexey Solodovnikov, who was last here here during the International Congress of Entomology in Brisbane in 2004 when he was a PhD student in Al Newton and Margaret Thayer's staphylinid group at the Field Museum in Chicago. He is now head of Coleoptera at the Natural History Museum of Denmark and teaches in association with the University of Copenhagen. Alexey was accompanied by research assistant Aslak Hansen and PhD student Josh Jenkins Shaw. Aslak is a masters grad and soon to start a PhD on staphylinids in Argentina. Josh is a graduate from University of East Anglia in UK and his PhD is supervised by Alexey in Denmark and co-supervised by Chris Reid (Australian Museum) and Gerry Cassis at University of NSW. His project deals with the Australian staphylinid group Amblyopinina which includes some interesting species of *Myotyphlus* (Fig. 2) which have a poorly understood relationship with certain mammals. Before the Queensland visit Josh had spent a couple of weeks on Lord Howe Island collecting with Chris Reid as part of the Australian Museum's on-going surveys of that fauna.

In Queensland, the Copenhagen crew spent a couple of weeks in North Queensland, based first at Julatten while they worked intensively at Mt Lewis, then at

Figs 1-2. 1. From left, Aslak Hansen, Alexey Solodovnikov and Josh Jenkins Shaw with their litter sifters at the ready on the mossy 1050 m summit of Mt Mitchell, at Cunningham's Gap. 2. A species of *Myotyphlus*, in the group of Staphylinidae being studied by Josh.

Tinaroo where they covered sites on the Atherton Tableland. They were keen to get good material for later molecular work and did lots of litter sifting to produce material for extraction through batteries of Winkler Funnels. In mid-April they came to Brisbane for a week's work at the Queensland Museum and DAF collections and a couple of field trips with Geoff Monteith to Mt Glorious and Cunningham's Gap. Josh and Aslak managed to catch the ESQ meeting on April 11 and Josh has joined up. Alexey and Aslak flew home to Denmark from Brisbane while Josh stayed on for collection visits to both the Australian Museum in Sydney and ANIC in Canberra.

Modanville, home of the birdwing butterfly

In recent years we've had a couple of items in the News Bulletin about Queensland towns that have adopted insects as their logo animal. Augathella has adopted the meat ant while Kin Kin has opted for rattle ants. Both towns have prominent sculptures of the insects on display. Just over the border, in northern NSW, the little hamlet of Modanville has adopted the Richmond Birdwing (*Ornithoptera richmondia*) as its symbol and has installed impressive welcome signs at both ends of the town. Modanville is about 10 km north of Lismore on the way to Dunoon and the Nightcap Range. It is surrounded by macadamia and blueberry plantations and plump dairy cattle which all grow on rich red soil that use to support the famous "Big Scrub" rainforests which were almost completely cleared by early settlers in the late 1800s. These were one of the strongholds of the magnificent Birdwing which is now protected and listed as endangered by both NSW and Qld Legislation.

Australian Museum has a successful expedition to Balls Pyramid

Balls Pyramid is the tallest volcanic stack in the world and is located just 23 km southeast of Lord Howe Island. Balls Pyramid is best known to entomologists as the home of the rarest insect in the world, the Lord Howe Island stick insect (*Dryococelus australis*). Once thought to be extinct, the stick insect was re-discovered on Balls Pyramid in 2001. Two breeding pairs were collected in 2003 and a successful breeding program at the Melbourne Zoo has hatched 13,000 eggs. The recent expedition by the Australian Museum enlisted the help of experienced rock climbers to help them scale the sheer cliffs in an effort to find the rare insect as well as conduct a comprehensive survey of the island's fauna. A live female *Dryococelus* was found by one of the climbers and aptly named 'Vanessa' after the climber who found her. 'Vanessa' will help add genetic diversity to the current breeding population at the Melbourne Zoo. The expedition also found a species of longhorn beetle (*Oricopus insulana*) which hadn't been seen for 140 years.

Balls Pyramid. Photo credit: Fanny Schertzer

Calligrapha explosion near Proserpine

Geoff Monteith, Queensland Museum

While driving back from Cairns in February this year, we paused a couple of days to explore dung beetles in the dry vine scrubs above the Proserpine Dam which is on the Proserpine River about 20 km west of, you guessed it, Proserpine. Among the overgrazed patches of grassland beside the road on Proserpine Station (25.389^{0}S X 148.363^{0}E) were meadows of the introduced malvaceous weed, Spinyhead Sida (*Sida acuta)*, which looked decidedly "moth-eaten". Stopping to take a look, we found they were actually "beetle-eaten" and the culprit was the attractive biocontrol chrysomelid *Calligrapha pantherina* Stål 1859 which had been introduced to Australia from Mexico in 1989 after extensive host testing (Forno *et al*, 1989). It was introduced to target *Sida acuta* and the less important weed, *Sida cordifolia* (Sidaretusa or Paddy's Lucerne) and has been quite effective against the former. It has subsequently been introduced to New Guinea (1999), Fiji and Vanuatu where the same weeds are a problem (Heard & Day, 2012). The beetles were in immense numbers at Proserpine and seemed to be mostly newly emerged adults feeding on what remained of the foliage (Fig 1). Some were laying batches of yellow eggs (Fig 2) and these were hatching into small families of larvae (Fig 3) which feed in groups for the first couple of instars, however it was difficult to see what these were going to eat.

Calligrapha pantherina has quite recently reached New Caledonia (1300 km east of Queensland and 300 km west of Vanuatu) under its own steam. It was first detected in November 2012 at Mt Mou which is between Noumea and the International Airport on the west coast (Mille *et al,* 2016) and has rapidly spread along the entire 500 km west coast where drier grazing situations are dominant. By March 2014 it had also been detected on Mare Island which is part of the Loyalty Islands, 50 km off the east coast of New Caledonia. The authors speculate on how it might have reached New Caledonia, perhaps by boat traffic or perhaps by extreme weather events from source populations in either Australia or Vanuatu. They express some reservations about the uncontrolled arrival of the beetle in view of the uniqueness of the endemic New Caledonian flora which includes two native species of *Sida.* However their concern is tempered by the presence of both *Sida acuta* and *Sida cordifolia* as introduced weeds of growing concern there, on which the unannounced beetle arrival can be expected to exert significant control.

Two weeks after we marvelled at the booming population of *Calligrapha* at Proserpine, Cyclone Debbie hit the Australian coast at that exact spot, causing devastating floods in the valley of the Proserpine River. One can't help wondering if some of the beetles we saw didn't also end up in New Caledonia! Thanks to Rosa Menendez for her photos.

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Figs 1-3. Mass hatching of the chrysomelid, *Calligrapha pantherina,* on *Sida acuta* west of Proserpine. 1. Adults stripping foliage. 2. Female laying eggs. 3. Hatching larvae. (Photos: Rosa Menendez)

Above: enthusiastic students. Right: Perry, Lani and Kathy

BugsEd: Inspiring the next generation of entomologists!

ESQ members, Perry Bennion and Kathy Ebert worked with Dr. Lani Heslan from BugsEd to lead an "Arthropod biodiversity expedition" at the end of March with 40 students and teachers from Forest Lake State High School. The group spent two days collecting arthropods at two different habitats near Boorabin, north of the Glass House Mountains. The students learned a variety of trapping methods, how to identify their samples to order level and how to pin their collected specimens. The students tallied their data to make comparisons between a rainforest site and an open eucalyptus site. The students were very enthusiastic and a few are now considering studying entomology in the future!

The History Corner...

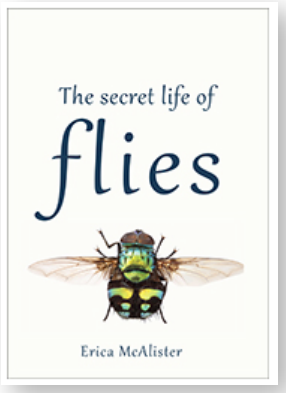
Eric Georg MJÖBERG (1882-1938)

Born in Sweden and educated in zoology at Stockholm (1908) and Lund (1912) Universities. Worked at State Entomological Institution, Stockholm Museum and taught school in Sweden 1903-1910. Leader of Swedish Scientific Expeditions to North-Western Australia in 1910-11. Second Australian Expedition, largely by himself, in 1912-13 to Queensland where made extensive insect collections in south Queensland (Mount Tamborine, Lamington Glen, Miriam Vale, Colosseum Creek), north-east Queensland (Ravenshoe, Cedar Creek, Malanda, Bellenden Ker, Tully, Yarrabah, Babinda, Cairns, Kuranda) and Cape York Peninsula (Cooktown, Laura, Coleman River). Detailed account of Queensland travels in his 1918 book *Bland Stenåldersmänniskor i Queenslands Vildmarker (Among stone age men in Queensland wild places).* Translation available Queensland State Library. Collections lodged in Stockholm Museum where Mjöberg described Australian ants, beetles, crickets, earwigs, termites and arranged study of other groups by numerous scientists. Mjöberg was later Swedish Consul in Sumatra, director of Sarawak Museum and led expedition to central Borneo. Died in poverty in Sweden.

Biography: Daniels, G. 2004. Eric Georg Mjöberg, p. 842-3. *Bibliography of Australian Entomology 1687 – 2000.* 2 vols, 1776 pp, privately published.

Book Review: The secret life of flies

a new book from CSIRO publishing, written by Erica McAlister



Flies have never been the focus of my attention. However, after reading Erica McAlister's new book, I have a new appreciation for these fascinating insects. McAlister is the curator of Diptera at the Natural History Museum of London and in her book, she shares her knowledge and enthusiasm for flies with a liberal dose of humour. In the introductory chapter, she gives us an overview of basic fly biology, followed by some amazing (and often gross) stories of fly larvae. Subsequent chapters are based on behaviour and feeding habits: from pollinators and detritivores to parasites and sanguivores. She reveals many amazing features in a very readable text with plenty of colour photos. Its an ideal book for the 'non-dipterist' entomologist or naturalist who wants to learn more about how amazing and important flies really are. Its changed how I think about flies - especially when I learned that the entire chocolate industry depends on a tiny little biting midge (Ceratopogonidae) to pollinate the cacao plants. Now thats a fly that I *really* appreciate!

--the Editor

Hardback | April 2017 | $ 29.95
ISBN: 9781486308026 | 256 pages | 200 x 130 mm
Publisher: CSIRO Publishing
Colour illustrations

Come celebrate Queensland Entomology
at the inaugural

Perkins Memorial Dinner

September 12, 2017

Every two years ESQ holds the Perkins Memorial Lecture when a prominent entomologist is invited to give a lecture on a topical theme of entomology in memory of Athol Perkins who was the first Head of Entomology at the University of Queensland and one of the founders of the Society in 1923.

As ESQ approaches its centenary year, Council has decided to initiate a dinner to be held on the evening of each Perkins Lecture day. The inaugural Perkins Dinner will be held in the beautiful function room of the St Lucia Golf Club on September 12 this year. We invite members to note the date. Final details will be given in the News Bulletin later in the year.

We hope the Dinner will provide an opportunity for Queensland entomologists to meet up in a pleasant social occasion, especially for those who trained or taught at the University of Queensland and who would like to catch up. It will also be a chance to meet with the Perkins lecturer who will be a guest of honour. Come along if you are one of the hundreds of entomologists who have served on ESQ Council over the years and celebrate its ongoing success. We expect to have a roll call of past ESQ Presidents of whom 40 are still living. A new Honorary Life Member will also be inducted and we plan to have photographic displays of past entomologists and student groups. The Convenor of the event is Geoff Monteith (geoff.monteith@bigpond.com) and he would welcome ideas and especially group photographs that can be used in the displays.

Have you got photos to share???

Group shots of entomologists past and present are needed for our displays!

2016 BugCatch

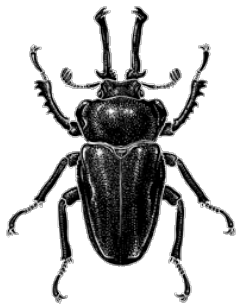
Change to the constitution regarding number of nominators required for membership

The ESQ Constitution currently states that all new membership applications are required to have two ESQ members nominate the new member as per Section 3.e that states: "*Any proposal for membership of the Society shall be signed by two Members and the nominee. The proposal is presented at the next meeting of the Council and approved by a two-thirds majority of the Council*."

At our November council meeting we discussed changing the number of nominators for new members from two to one. It is hoped that this change will make it easier for interested students to join the society as many of them do not know many society members. The amended text to the constitution is included below and will be voted on at the June meeting. If you are unable to attend the meeting and wish to have a vote, please send the proxy vote form to Mark Schutze before the meeting date.

Section 3.e of the ESQ Constitution shall be reworded to change Section 3.e from:

> "*Any proposal for membership of the Society shall be signed by two Members and the nominee. The proposal is presented at the next meeting of the Council and approved by a two-thirds majority of the Council*."
> to:
> "*Any proposal for membership of the Society shall be signed by one Member and the nominee. The proposal is presented at the next meeting of the Council and approved by a two-thirds majority of the Council*."



This amendment must now be approved by members as per Section 15 of the ESQ Constitution: "*This Constitution may be amended by a two-thirds majority of Members voting at a General Meeting or an Annual General Meeting either in person or by proxy. Any Member who is unable to attend may appoint in writing to the Secretary before the meeting a Member of the Society to act as a proxy on his or her behalf.*

Can't make it to the meeting? You can still have a vote!

Entomological Society of Queensland: PROXY VOTE FORM

I nominate the following member of the Society:

.....

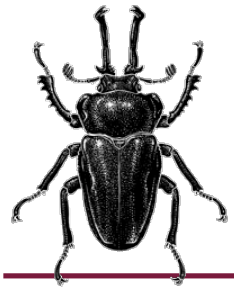
to vote on my behalf at the Annual General Meeting of the Society at 1.00 pm on 13 June 2017

Your name:.....

Signature:.....

Date:.....

Cut out, copy or scan this form and send/email to the Honorary Secretary, Mark Schutze, at m.schutze@qut.edu.au or P.O.Box 537, Indooroopilly. Q. 4068. Forms must be in the hands of the Secretary before the commencement of meeting.



Announcements and Notices

Casual Entomology Technician required

The position is a casual, temporary TO2 equivalent (Technical Officer Level 2) 0.6 FTE, offered within Biosecurity Queensland, DAF. The person would be required one to two days per week. We're flexible with the days the technician choses to work. Based at the Biosecurity Sciences Laboratory in Coopers Plains.

The role in brief:

- Examination of bee-eater bird pellets/ingesta for *Apis cerana* wings
- Examination of bee hive sticky mats for exotic mites
- Morphological identification of *Apis* sp. and other Australian bee fauna
- Exclusion of honey bee nest material for *Varroa* sp. and other exotic mites

Previous entomology experience is desirable, and familiarity with quality laboratory systems would be viewed favourably given our lab is NATA accredited. All inquiries should be directed to me via email at Leanne.Nelson@daf.qld.gov.au or phone (07) 37088772.

Call for nominations:

The inaugural Pat Marks Medal

The Pat Marks Medal is the Society's career award for excellence in entomology and is given every two years to a member of the Society who has demonstrated excellence in entomology over many years. The award is named in honour of Dr Elizabeth "Pat" Marks, the Society's first Vice President and Chairman of the Executive. Pat was an outstanding entomologist who embodied the excellence in entomological pursuits that the award recognises. To make a nomination for the 2017 Pat Marks Medal, follow the instructions on the Australian Entomological Society's website: https://www.austentsoc.org.au and follow link to Awards.

Are you an Ento-Artist??

The *Art meets Science Exhibition* is an opportunity for artists from across South East Queensland to showcase their recent artworks that demonstrate a strong Art-Science connection. The partner organisations at the Ecosciences Precinct (ESP) Dutton Park hold a number of public and internal events during National Science week. Since 2012, one of these events has been the hosting of an Art meets Science Exhibition. The Exhibitions have proved to be very popular with visitors to the building and the approximately 800 science workers at ESP. If your recent artworks demonstrate a strong Art-Science connection and meet the other criteria and are suitable for the space then please consider submitting your Expression of Interest online **by 5 pm Friday 2 June 2017.** For more information see: https://www.qld.gov.au/dsiti/initiatives/art-meets-science-exhibition/exhibition-details/

The Peer Prize for Women in Science 2017

The Sun Foundation is excited to launch the second annual Peer Prize for Women in Science. This is an annual prize for women researchers across Australia with a mission to accelerate open knowledge exchange and cross-disciplinary innovation. Last year's inaugural Sun Foundation Women in Science Prize was the first of its kind in the world and was a huge success. Over 1400 researchers from around the world voted and the competition engaged nearly 100,000 people. There are two main areas of research focus: 1) Life Sciences and 2) Earth, Environmental and Space Sciences. The prize for each category has increased to $20,000. Find out more at https://the-peer-prize-for-women-in-science-2017.thinkable.org/

Meetings & conferences

3rd Hemipteran-Plant Interactions Symposium
June 4–8, 2017
Madrid, SPAIN
http://www.hpis2017.csic.es/

10th Arthropod Genomics Symposium and Arthropod Bioinformatics workshop
June 6–11, 2017
Eck Institute for Global Health, University of Notre Dame, Indiana, USA
http://globalhealth.nd.edu/10th-annual-arthropod-genomics-symposium/

EVOLUTION 2017
Joint Congress between the American Society of Naturalists (ASN), The Society of Systematic Biologists (SSB) and the Society for the Study of Evolution (SSE)
23-27 June 2017, Portland, OR
http://www.evolutionmeetings.org/future-meetings-2017.html

16th International symposium on insect-plant interactions (SIP2017)
July 2–5, 2017
Tours, France
https://sip2017.sciencesconf.org/

Joint Genetics Society of Australasia and New Zealand Society for Biochemistry and molecular biology Conference 2017
July 3–6, 2017,
University of Otago, Dunedin, NEW ZEALAND
http://www.genetics.org.au/

3rd BioSyst.EU meeting
August 15–18, 2017
University of Gothenburg, SWEDEN
http://www.conferencemanager.se/BiosystEU2017/

16th Congress of the European Society for Evolutionary Biology
20-25 August 2017
Groningen, the Netherlands
http://www.eseb2017.nl/

IV International Congress on Invertebrate Morphology (ICIM4)
18-23 August 2017
Moscow State University, Moscow, RUSSIA
http://www.icim4.com/

A Collections Meeting With a Difference: Genomics, Collections, Adaptation and Phylogeny
12 – 14 September 2017
CSIRO, Canberra ACT
http://cba.anu.edu.au/news-events/genomics-and-collections-adaptation-macroevolution

Science Protecting Plant Health
26-28 September 2017
Brisbane Convention and Exhibition Ctr
Brisbane QLD
www.sciplant2017.com.au

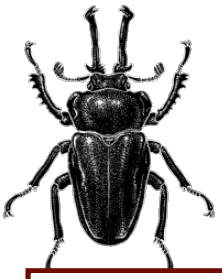
Australian Entomological Society Scientific Conference and 48th AGM 2017
September 17–20, 2017
Crowne Plaza, Terrigal, NSW
http://www.aesconferences.com.au/

21st Evolutionary Biology Meeting
September 26–29, 2017
Marseilles, FRANCE
http://sites.univ-provence.fr/evol-cgr/

Ignite. Inspire. Innovate. Entomology 2017
November 5–8, 2017
Denver, Colorado, USA
http://www.entsoc.org/am/fm/index

Society of Australian Systematic Biologists / Australasian Systematic Botany Society
26–29 November 2017
Adelaide, SA
https://systematics.ourplants.org

Ecological Society of Australia / New Zealand Ecological Society
26 Nov - 1 Dec 2017
Hunter Valley, NSW
http://ecotas2017.org.au



Diary Dates for 2017

Meetings held on the second Tuesday of the respective month

MARCH 14	Bradley Brown	AGM and Presidential Address: " *Exploration in biological control - a US perspective"*
APRIL 11	Graeme Smith	*"Silverfish - Who cares?!"*
MAY 9	Mike Muller	*"Mosquito management in Brisbane"*
JUNE 13	Notes and Exhibits	Notes & Exhibits
AUGUST 8	Paul Ebert	*Topic: Stored product insect management*
SEPTEMBER 12	Perkins Memorial Lecture: Madeline Beekman	*Topic: Insects as model systems*
OCTOBER 11	Roger Kitching	*"New molecular tools for gut content analysis"*
NOVEMBER 14	Jon Marshall	*Topic: Aquatic insects*
DECEMBER 12	Notes & Exhibits	Notes and Exhibits/Christmas Afternoon Tea

SOCIETY SUBSCRIPTION RATES

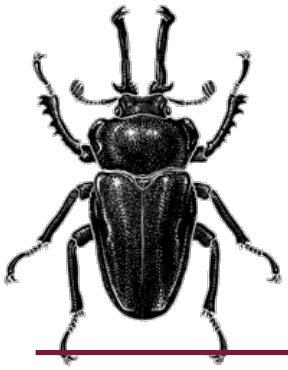
GENERAL	Person who has full membership privileges	**$30pa**
JOINT	Residents in the same household who share a copy of the *News Bulletin*, but each otherwise have full membership privileges.	**$36pa**
STUDENT	Student membership conveys full membership privileges at a reduced rate. Students and others at the discretion of the Society Council.	**$18pa**

ESQ membership subscriptions should be sent to the Treasurer, PO Box 537, Indooroopilly, QLD 4068
http://www.esq.org.au/membership.html

THE *AUSTRALIAN ENTOMOLOGIST* SUBSCRIPTION RATES

AUSTRALIA	Individuals/Institutions	**AU$33pa/AU$37pa**
ASIA/PACIFIC	Individuals/Institutions	**AU$40pa/AU$45pa**
ELSEWHERE	Individuals/Institutions	**AU$45pa/AU$50pa**
ELECTRONIC	Individuals/Institutions	**AU$25pa/AU$30pa**

Journal subscriptions should be sent to the Business Manager, PO Box 537, Indooroopilly QLD 4068
http://www.esq.org.au/publications.html



Entomological Society of Queensland

Notice of next meeting:

Tuesday, June 13th, 2017, 1:00 pm

Notes & Exhibits

Presentations will include short talks on

insect venoms, preference-performance hypothesis in herbivorous insects, a recount of the recent Bush Blitz to Cape York, plus more!

Anyone is welcome to present a short talk or exhibit at 'Notes & Exhibits' meetings. We would love to hear about what you have found or learned in your laboratory, backyard or bushwalk or workplace!

Contact Tim Heard if you have something you would like to share at tim@sugarbag.net

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All welcome! Join us after the meeting for tea and coffee.

Ground floor Seminar Room, Ecosciences Precinct, Boggo Road, DUTTON PARK

***More venue details available at* http://www.esq.org.au/events.html**

Next News Bulletin:

Volume 45, Issue 4 (June 2017)

CONTRIBUTIONS WELCOME

Deadline Thursday, June 22nd, 2017.

Send your news/stories/notices to the editor at: k.ebert@uq.edu.au