The BowerBird Bugle

23 March 2018 Ken Walker (kwalker@museum.vic.gov.au) Museums Victoria. Edition 56.

Hi All – To begin, a very belated Happy New Year and best wishes for an enjoyable and successful 2018.

The Taxonomy Decadal Plan 2018-2027 is almost done, dusted and sent to the printers. I continue to find the text interesting in the ways that it tries to educate what taxonomists do and the inherent benefits to society. I will give these final plan comments for what it is worth to readers. This is to be the front cover of the document:

These are some of the interesting quotes from the document:

- 11 million species on earth, nearly 80% have not yet been discovered, delimited, named or documented.

- Around 30% of Australasia's estimated ~600,000 species have been discovered in the past 200 years (compared to less than 20% worldwide).

- A teaspoon of fertile soil may contain up to a billion bacteria, many metres of fungal filaments, thousands of protozoa and hundreds of tiny invertebrates, comprising up to several thousand distinct species. Most of these have never been named, and we have little idea what most of them do.

- 50% of all pharmaceutical compounds registered for use in the USA are derived from, or were originally discovered in, living organisms.

- 12,264: the number of downloads in the first two days of FrogID, an app from the Australian Museum for identifying, discovering, and helping conserve Australia's frogs.

- Australia is one of 17 countries classed as biologically megadiverse: together, these countries account for less than 10% of the Earth's land surface, but support more than 70% of its terrestrial biodiversity.

- Kangaroos and kiwi, as well as being iconic Australians and New Zealanders, illustrate one aspect of the global importance of Australasian biodiversity: we are home to

ancient lineages that are key to an understanding of the evolution of life on Earth. Marsupials, with the Australian and New Guinean monotremes (platypus and echidnas), represent the two earliest known living mammal lineages, and are most diverse here. Kiwi, emus and cassowaries are members of one of the oldest lineages of all birds. Songbirds, the world's largest group of birds, originated in Australasia, the earliest-diverging lineages being the New Zealand wrens and the Australian lyrebird and scrub birds.

- Only 10% of the multicellular species (corals, fish, algae and invertebrates) of the Great Barrier Reef, one of Australasia's most significant biodiversity assets, have been discovered and documented to date.

- 25,000 - the estimated number of new Australian species of organisms (plants, animals, fungi and algae) discovered and named in the decade 2008–2017.

- The lack of collecting now will limit our ability to track responses to environmental change, at a time of major climate shifts with broad-reaching consequences for biodiversity.

- The most common age category for taxonomists in 1975 was 30–39. In 2017 it was 40–44 for females and 55–59 for males.

- The Beyond the Box Digitization Competition offered a $1 million in 2015 to a person or team who created a technology to increase the speed and accuracy of digitization of a drawer of insect specimens and their

associated data. **No entries were received.** Digitisation of museum collections is a hard problem.

- The Earth has entered a new era, the Anthropocene. Like many other transitions between geological eras, the Anthropocene is likely to be marked by a mass extinction event, though uniquely, this one is avoidable, and human-induced. Merely naming and documenting a species will not prevent its extinction. However, it's an important first step, and is essential for legal protection. The knowledge that comes with taxonomic documentation, knowledge of distribution, habitat, and abundance or rarity plays an important part in conservation planning for species and areas. Taxa that are undocumented are more likely to be lost, and lost without knowledge of their loss. Every extinct species is a lost opportunity.

Taxonomy and biosystematics provide value to multiple sectors of the economy:

- in agriculture, trade and biosecurity, taxonomists and biosystematists identify and help prevent pests and diseases from reaching our shores;

- in medicine and public health, taxonomists and biosystematists help in pathology, drug development and discovery, and disease control;

- in ecology and environmental science, taxonomists and biosystematics help land managers and governments understand and make balanced environmental decisions, and understand how our environment is changing; and,

- in industry, taxonomists and systematists provide knowledge used in manufacturing processes, and inspiration for new products and services based on highly evolved biological traits and behaviours.

There are five keystone initiatives identified in the document

- **Accelerating discovery**, to transform our understanding of Australasian biodiversity and evolutionary history through accelerated species discovery, classification, and exploration of the tree of life.

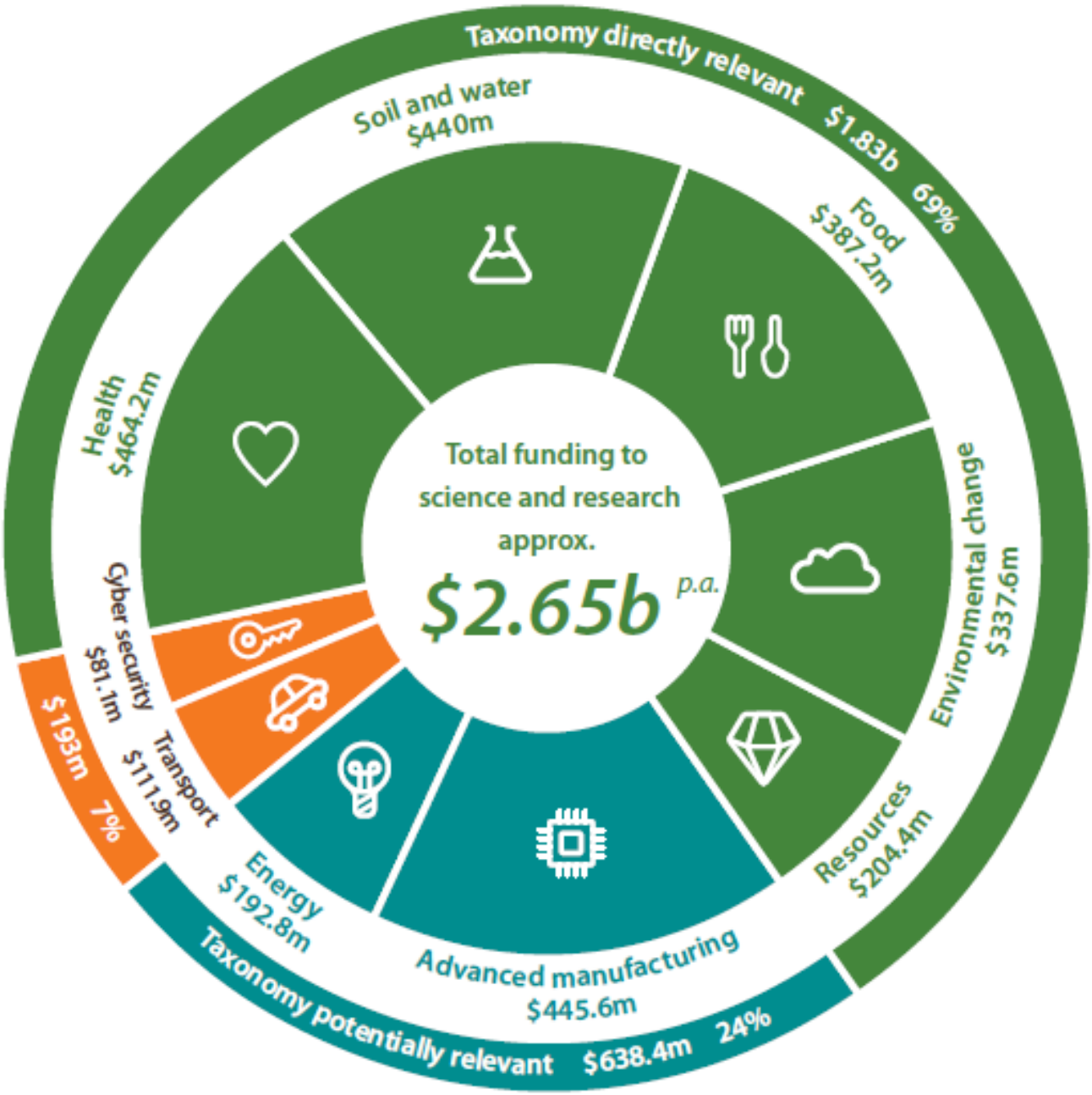
- **Enhancing services for end-users** – harnessing new technologies to create, extend and maintain integrated, accessible identification tools and information portals that will transform biodiversity decision-making and to facilitate new biodiversity knowledge and applications across conservation, health, biosecurity and agriculture.

- **Engaging with Indigenous knowledge** – to ensure that the perspectives, needs and aspirations of Australia's Aboriginal and Torres Strait Islander people and New Zealand's Māori people are incorporated across the activities of this plan.

- **Educating for the future** - inspiring the public and the next generation of workers and leaders in our field, to celebrate the unique value and immense potential of the Australasian biota.

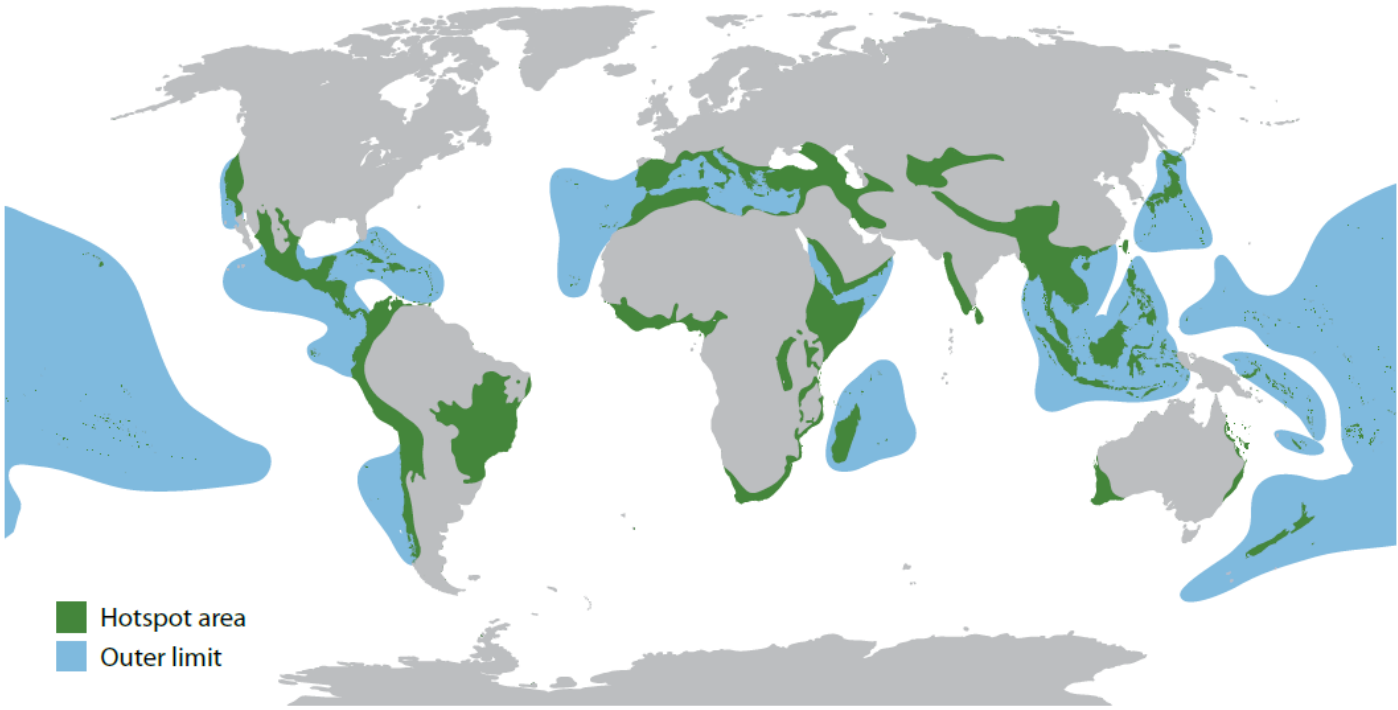
- **Supporting our workforce** – increasing capability, provide strategic leadership, and improving the integration of our disciplines and their infrastructure in Australia and New Zealand.

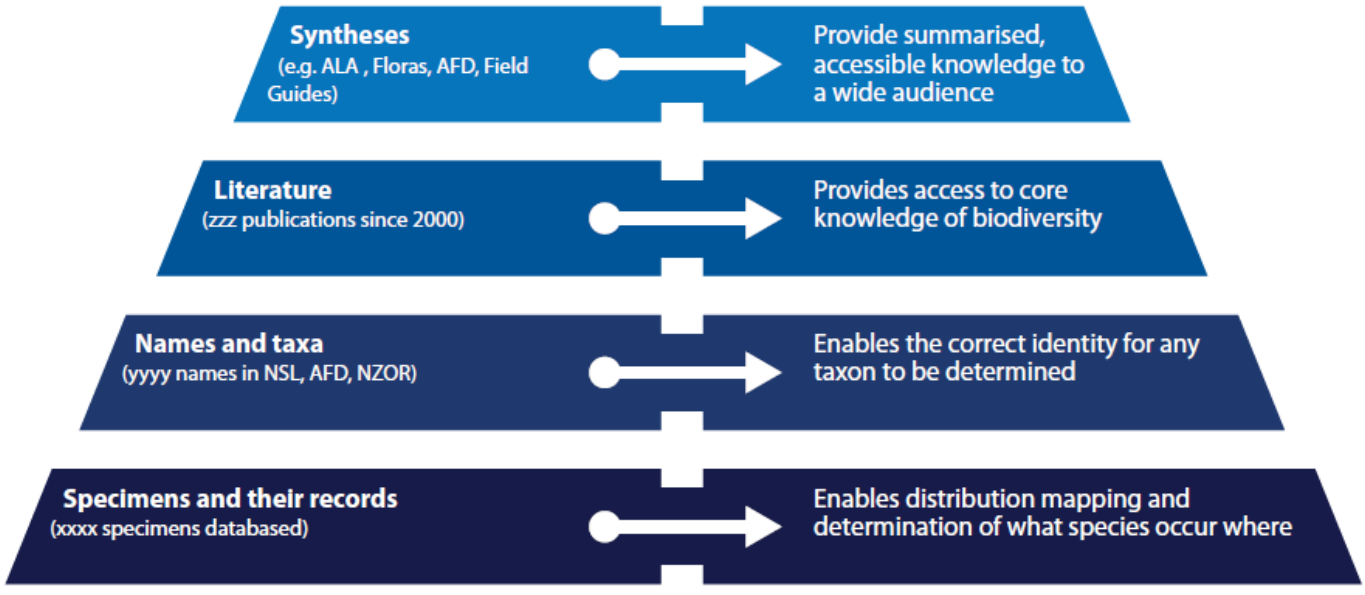
Taxonomy and biosystematics are directly relevant to, and help underpin, five of Australia's Science and Research Priorities, thereby supporting 70 per cent of the A$2.65 billion government investment in these priority areas.



The world’s 35 biodiversity hotspots; representing just 2.3% of Earth’s land surface, but between them they contain c. 50% of the world’s endemic plant species and 42% of all terrestrial vertebrates.

These Hotspots have lost >85% of their original habitat, and are significantly threatened by extinctions.





I played “entomologist” last weekend !

Last weekend, I noticed a sort of swirling halo surrounding my dog’s head. Saxon is a border kelpie cross and there was a myriad of flies circling his head and in particular around his ears and snout. Actually, it was Saxon’s constant flicking of his ears that attracted my initial attention.

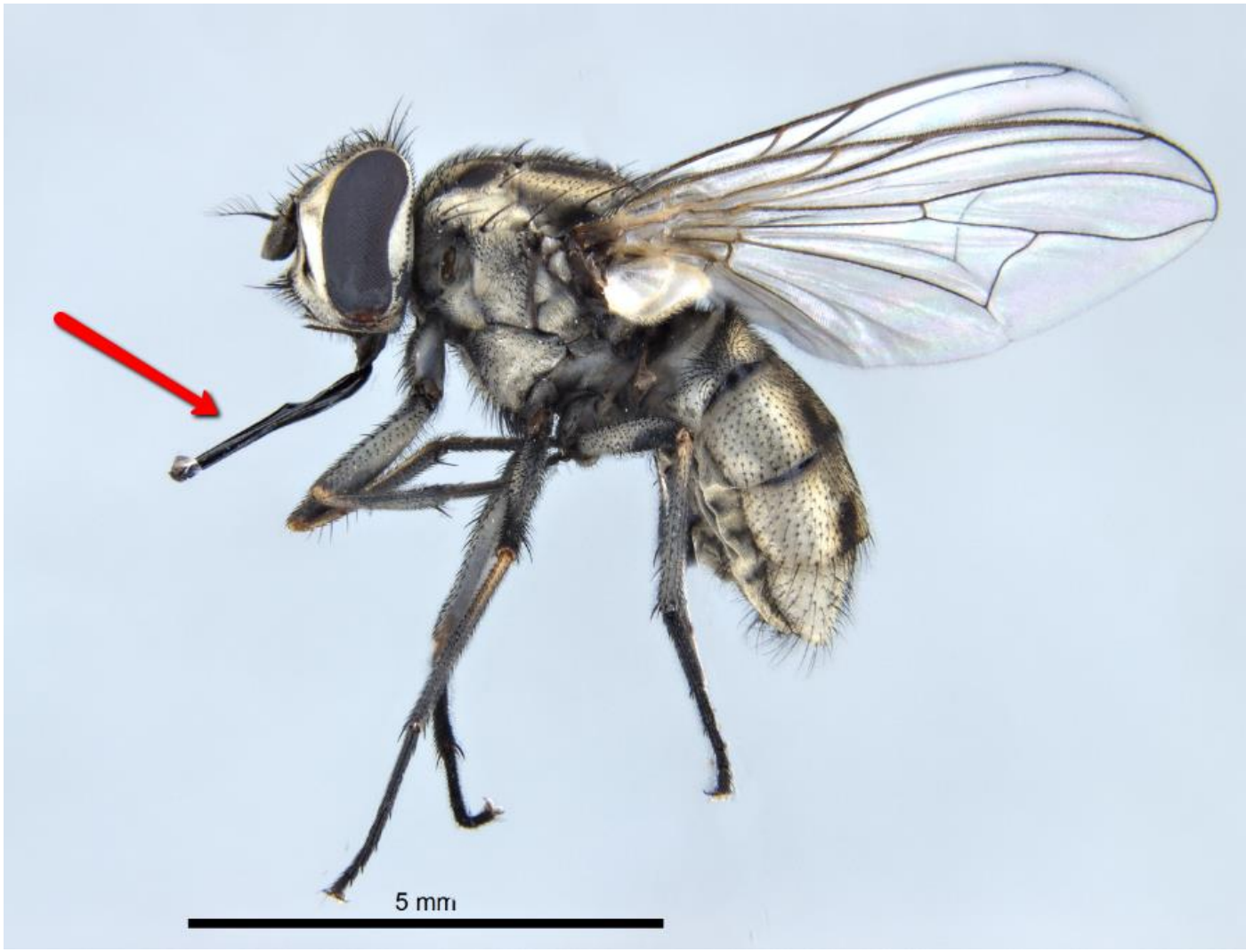
Then the penny dropped – Stable flies ... better known as *Stomoxys calcitrans*. This is a blood sucking fly that specialises in the blood of mammals. Originally from Eurasia, this species of fly is now found world-wide and can be either a pest or nuisance species.

The late summer period of February-March is peak time for these flies. In the country, these flies mainly attack cattle and horses and their biting behaviour can actually cause anaemia due to loss of blood. In the city, it’s our mammalian pets and ourselves that attract these flies.

Stable flies are about 7-8mm in body length and they look very similar to the common house fly (*Musca domentica*) except for two important features – the mouthparts and the dorsal thorax colour markings.

Below is what the stable fly looks like in side view. Typical for a house fly except for the elongate, black mouthparts and in dorsal view, the four black longitudinal lines. Flies generally have soft tissue, almost mop like mouthparts.

The stable fly’s elongated and hardened mouthparts are designed to push through fur to get to the animal’s skin.


5 mm

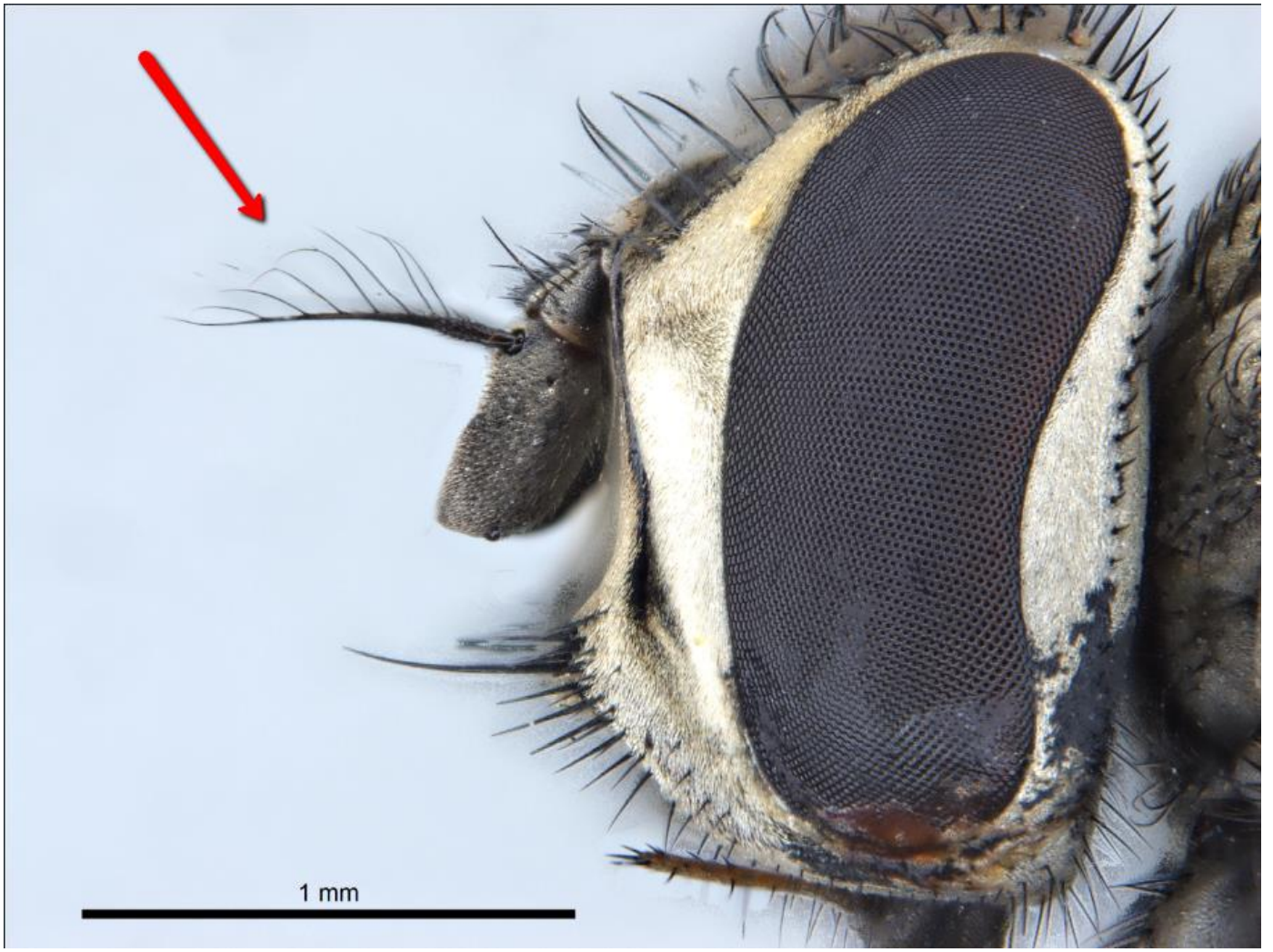

2 mm

So, how does the fly find its host? Warm blooded mammals exhale carbon dioxide (CO_2) which drifts off downwind from the animal. The fly detects the CO_2 and flies upwind to find the source of the CO_2.

What does it use to smell the CO_2? It's nose of course which is actually part of its antennae (see red arrow). Each antenna has 8 branches and these branches are covered with smell receptors called "chemoreceptors" designed to smell CO_2.

When the fly gets close to its host (ie. victim), it senses the heat coming from the mammal and hones in on the hottest spot – which is any area that has little to no hair. So, the tips of the dog ears or the end of the snout are favoured placed to bite.

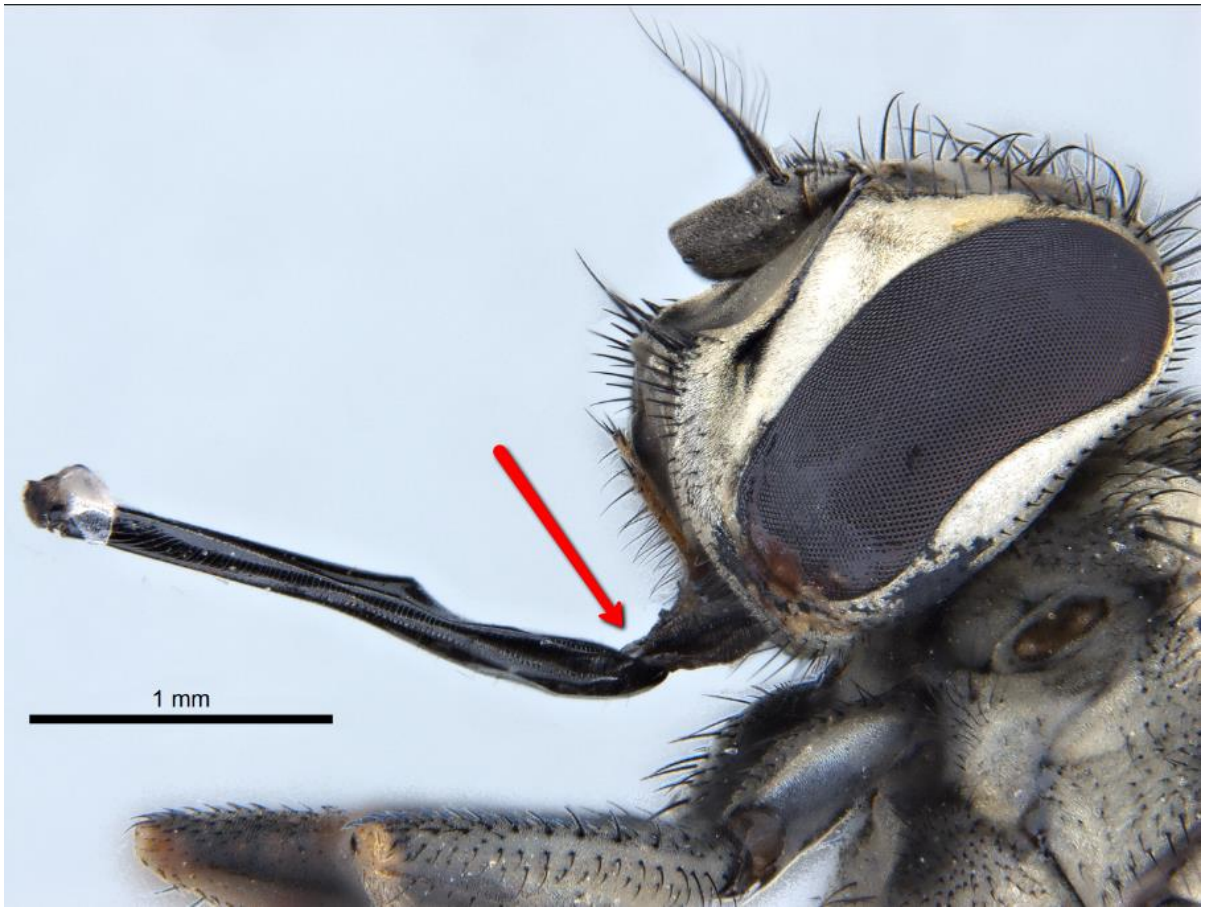
Have you ever wondered why when you are lying in bed a mosquito always buzzes around your ears? Your ears are where the blood flow comes closest to the skin surface so your ears give off lots of body heat which attracts those pesky mossies.



The mouthparts of the stable fly are built for purpose. The elongated, black coloured mouthpart is a solid structure that is flexible only at the base (see red arrow).

For comparison, I have photographed the head and biting mouthparts of an *Aedes* mosquito. While the mosquito mouthparts are longer than those of the stable fly, you can see the stable fly's mouthparts are more robust and stout compared to those of the mossie.

Each is designed to suck mammalian blood but each has their own specially modified mouthparts.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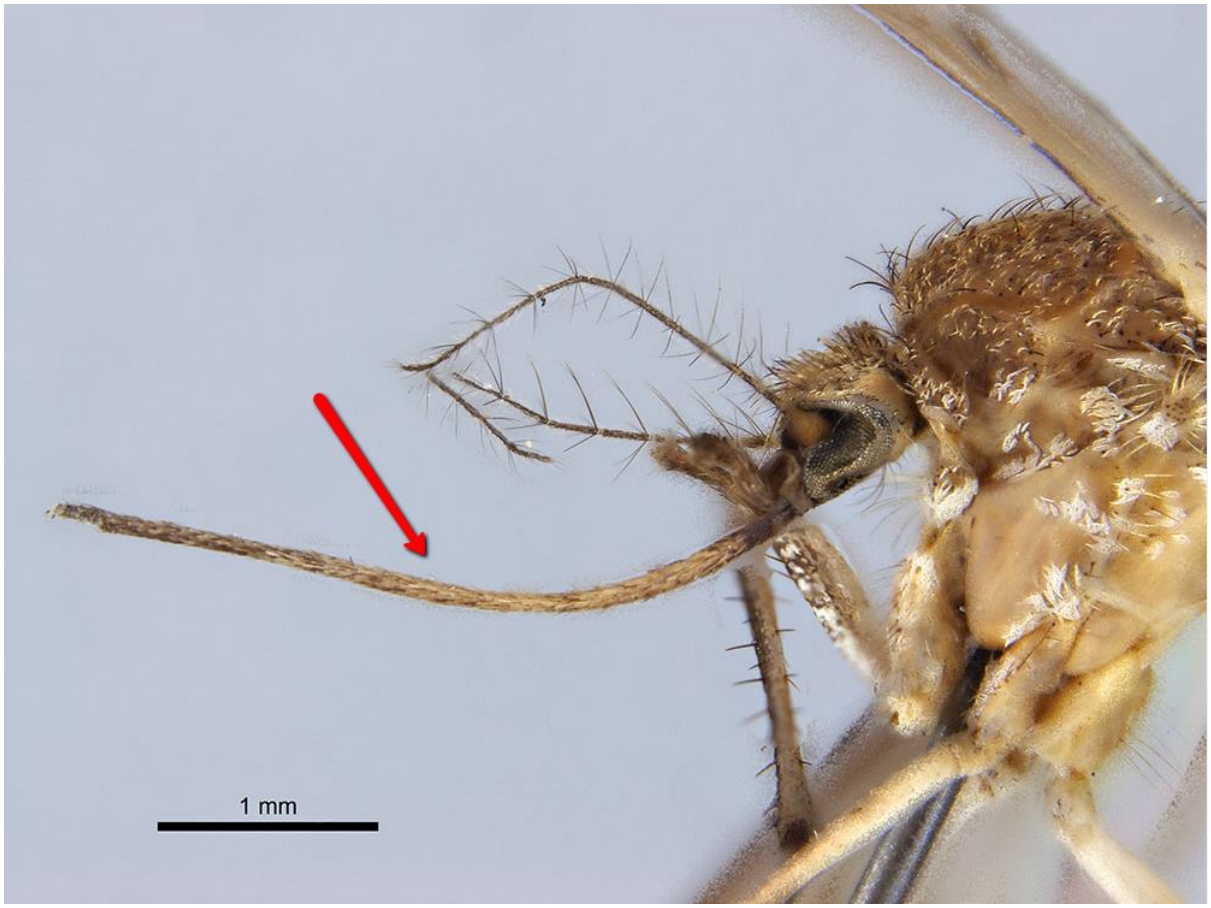
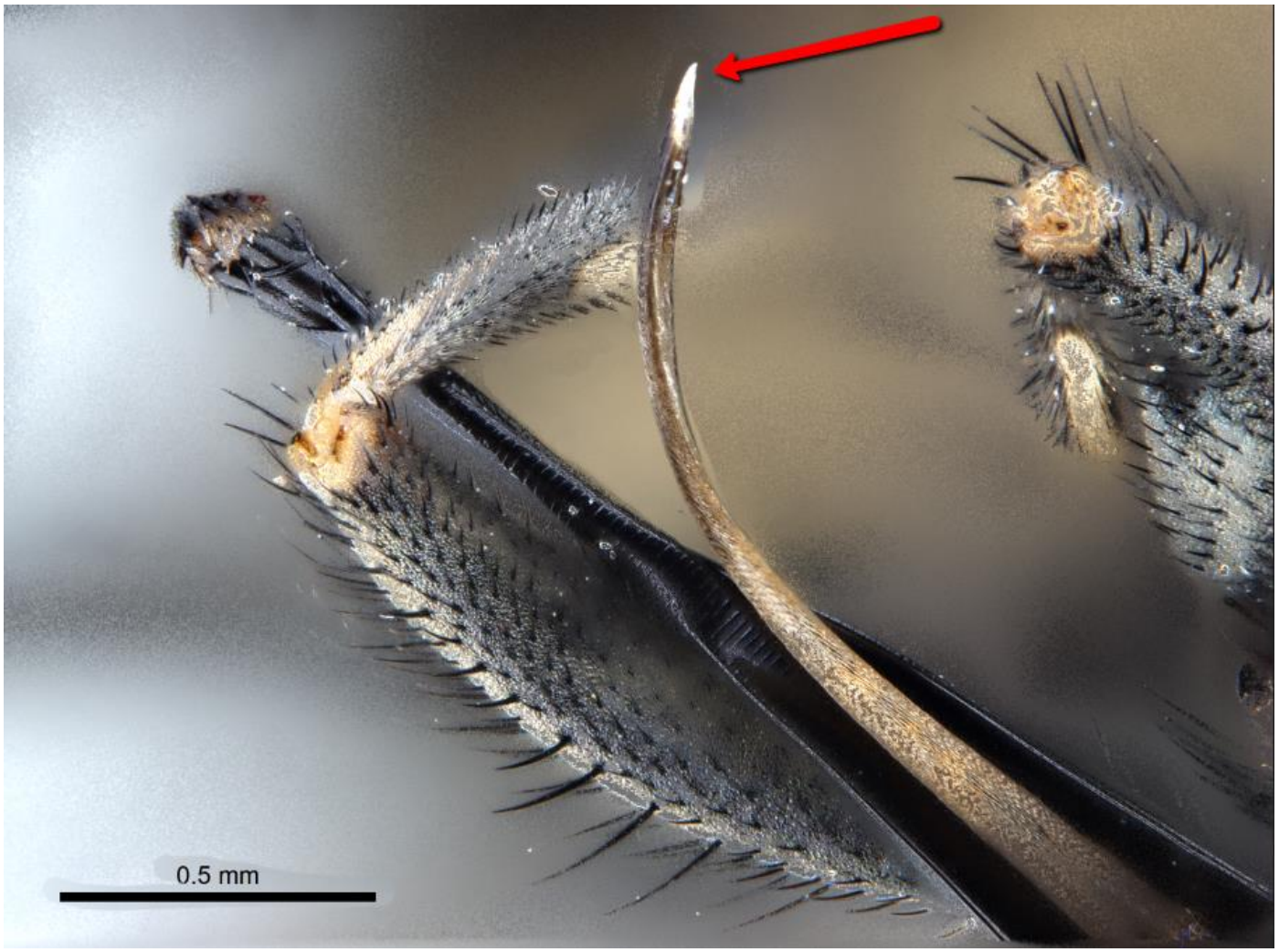

1 mm

The elongated mouthpart is hollow along its length. Inside this tube lies a sharp-tipped, lance like implement (see arrow) which is used to pierce the skin and start the blood flow. The blood is then sucked up the hollow tube.



Over the weekend, I collected and dispatched over 100 stable flies flying around my dog. I pinned about 20 of these flies to add fresh material to the museum’s insect collection. We had about 10 of these flies in the collection but they were collected over 50 years ago. I compared the two sets of specimens and nothing has changed.

You can protect your pets with the application of an insecticide either as a cream or spray. Just apply to the ears. I got my insecticide from the local Pet Barn but vets sell these chemicals as well. However, I prefer the catch and not release method !

The major problem for your pets from the bite of stable flies are secondary infections at the bite sites – but that is not common.

So, check your outside mammalian pets for these flies and help them get through the months of February and March during the stable fly invasion period.

You too can play “entomologist”. (:->!

Don’t forget to check your local Acacia plants.

Linda Rogan recently posted some lovely images of the Imperial blue butterfly (*Jalmenus evagoras*) adults, larvae and pupae with attendant ants. In particular, look for younger plants or fresh regrowth.

Jalmenus evagoras Location: Yallambie VIC Photos by Linda Rogan

Linda has her eye in for roosting native bees!

Lipotriches Austronomia australica Location: Yallambie VIC Photos by Linda Rogan

Lipotriches Austronomia submoerens Location: Eltham North VIC Photos by Linda Rogan

Amazing recent photos

Hypoblemum Jumping spider Location: Emerald, Qld Photo by Laurence Sanders

Porismus strigatus Location: Won Wron, Vic Photo by David Akers

Wombat berries (Eustrephus latifolius) Location: Lake Macquarie NSW Photo by Janet Grevillea

Eutryonia monstrifera Location: Cootharaba QLD Photo Donna

Tomkinson

Australoneda bourgeoisi Location: Pomona QLD Photo by Donna Tomkinson

Caper White (Belenois java) Location: Cootharaba QLD Photo by Donna Tomkinson

Hylaeus bee nesting in Hills Hoist Location: Wollongong NSW Photo by Jeannie

Hylaeus bee nesting in cardboard Location: Jandakot WA Photo by Kaye Arcaro

A bubbling bee *Meroglossa modesta* Location: Emerald, Qld Photo by Laurence Sanders

Maratus chrysomelas Location: Emerald, Photo by Laurence Sanders

Jumping spider with prey Location: Emerald, Qld Photo by Laurence Sanders

Flat-footed fly, Platypezidae Location: Birkdale QLD Photo by Erica Siegel

Assassin bug, Ptilocnemus femoralis Location: Tom Groggin VIC Photo by Martin Lagerwey

Moon jelly, Aurelia aurita Location: nr Bairnsdale VIC Photo by John Eichler

Megachile sp. Location: Brisbane Photos by Erica Siegel

More amazing springtail images !

Wolmersleymeria Location: Warburton VIC Photo by Nick Porch

Neanuridae Location: Silvan VIC Photo by Reiner Richter

Entognatha Location: Mount Waverley VIC Photo by Nick Porch

Entomobrya Location: Sherbrooke VIC Photo by Nick Porch

A wonderful case of mimicry that initially fooled me.

On 20 February 2018, Reiner Richter posted images from Kallista of what I initially mistook as a *Megachile* leaf cutter bee that had a “red bum”.

Malometasternum rufocaudatum Kallista VIC Photo by Reiner Richter

My mind immediately went to *Megachile ferox* – a common Victorian megachile bee with the requisite “red bum”.

Megachile ferox Location: Briar Hill VIC Photo by Linda Rogan

Indeed, I did a quick check and found at least *Megachile* species with “red bums” on the east coast of Australia.

Megachile canifrons

Megachile tosticauda

Megachile apicata

Megachile ignita

Megachile macleayi

But then I scanned through the remaining images that Reiner had posted and soon realised the images were of a syrphid fly that was laying eggs in the wood of a blackwood wattle (*Acacia melanoxylon)*.

Malometasternum rufocaudatum Kallista VIC Photos by Reiner Richter

I was amazed at the superb mimicry of this fly presumably mimicking a megachilid bee.

I thought possibly a species of *Microdon* but a check of images for this genus provided no matches so I went out to the entomological network. An expert in these flies is an ex-pat Australian currently working in the Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa – Dr Jeff Skevington. We “Aussie entos” are a relatively small group who all know each other and are generally happy to provide identifications within our own specialities.

The next morning was an excited rely from Jeff. Reiner’s fly has a name twice the body length of the fly - *Malometasternum rufocaudatum* first described in 1926 from Barrington Tops, NSW. This species occurs along the east coast of Australia.

Jeff said: “This is currently my most wanted genus for molecular work.” Hopefully, Reiner can collect a specimen.

A check on BowerBird discovered another record of this fly from Wollongong NSW.

Malometasternum rufocaudatum Location: Wollongong NSW. Photo by Jeannie

More stunning images / records

Rhyothemis resplendens Location: Edge Hill QLD Photo by Graham Winterflood

Austroaeschna Location: Tamborine Mountain QLD Photo by Rose Robin

Austrocnemis splendida Location: Gembrook VIC Photo by John Eichler

Austrolestes leda Location: Won Wron VIC Photo by Reiner Richter

Diplacodes haematodes Location: Mareeba QLD Photo by Linda Rogan

Orthetrum caledonicum Location: Mount Coot-Tha QLD Photo by Jenny Thynne

Let’s wet your whistle as it’s almost fungal season !

Cyathus stercoreus Location: Seventeen Mile QLD Photo by Gordon Claridge

Ascomycota Location: Bellthorpe QLD Photo by Glenda Walter

Marasmiellus Location: Eumundi QLD Photo by Sue Graham

Termite mound fungus - *Podaxis beringamensis* Location: Anduramba QLD Photo by Gordon Claridge

Add this new word to your vocabulary – “leucistic”.

The word “leucistic” was applied to the plumage of the bird in the image below. The word “leucistic” mean “having whitish fur, plumage, or skin due to a lack of pigment”.

The museum’s ornithologist, Dr Karen Rowe, had difficulty confidently identifying this image. Karen described it as “might be a leucistic starling, although the bill looks too curved at the end. “

I love it when even the “experts” get stumped.

So, see if you can drop the word “leucistic” into a casual conversation over a cup of tea with a friend. You are sure to provoke a question or two. (:->!

Possible “leucistic” starling Location: Footscray VIC Photo by Tom Nataprawira

Mammal feast!

Tachyglossus aculeatus Location: Braeside VIC Photo by Adam Edmonds

Antechinus agilis Location: Jeeralang Junction VIC Photo by Matt Campbell

Microbats Location: Mogo NSW Photo by Irene Richardson

Eubalaena australis Location: Warrnambool VIC Photos by Adam Edmonds

Peramelidae Location: Tamborine Mountain QLD Photo Rose Robin

Tagged *Macropus giganteus* Location: Wilsons Promontory VIC Photo by Lek

And finally, what's a Bugle without Mark Berkery's

Nature Place

On the flowers, he knows where to go for a bite to eat.

At one point he was eager to get on my finger … didn't fancy testing his deadly kiss.

Though the pain, as sensation, could be used to separate from the mind that would attach to it.

Sensation is distinct from thought and emotion.

And thinking is stopped before it begins …

… where it arises, from the self.

In the belly, not in the head.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As always ….. from BowerBird .. that’s your lot for this month.

Haveagoodweekend all …. Happy photographing …

Cheers – Ken

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