Worldwide Dragonfly Association

# AGRION

THE NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

PATRON: Professor Edward O. Wilson FRS

Volume 7, Number 2 July 2003

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ISSN 1476-2552

## EDITORIAL

Sadly I have to report the death of Dr D.A.L. Davies. He died on March 2nd this year, just two weeks before his 80th birthday. Allen never joined the WDA but I know many of our members will remember him with affection – and regret the passing of a very remarkable and colourful man. Somehow he was larger than life and his enthusiasm for all things odonate knew no bounds. Graham Vick has written an Obituary, which may be found on page 26.

This number is largely concerned with the very successful 3rd WDA Symposium hosted by John Hawking and his wife Robyn in January, and condensed reports of the Biennial General Meeting and Board of Trustees Meetings. I would, however, like to remind members that this newsletter, in addition to being a vehicle for the conveying of WDA business matters, is also one that can record members' odonatological exploits and experiences in a non-scientific fashion. Please don't let them cease winging their way to me!!

# MESSAGE from the PRESIDENT - Mike May

As I hope most of you are aware, I became WDA President at the Symposium in January 2003, held in Beechworth, Australia. I accepted the position upon solemn assurances from both of my predecessors that little or no effort was required and have spent the last five months becoming sadly disillusioned. Nevertheless, the Symposium, and all my interactions with our new Board, have reinforced my optimism that WDA is and will continue to be a very active and vital, as well as fun, society.

Both the high quality of Symposium contributions and of the papers being published in the International Journal of Odonatology are very impressive considering the small size of the Society. That small size is in many ways an advantage, because it allows us to be an unusually close-knit society. Nevertheless, one of my hopes for the next few years is to increase our membership – so go out and twist the arms of all your non-member odonatological friends, and spread the word about the fascination and rewards of studying dragonflies. This effort not only can give us a more secure financial base but will also help us become ever more truly worldwide and more capable of advancing the cause of odonate research and conservation.

As you will see elsewhere in AGRION, your Board of Trustees, and many other members, are working on several fronts to optimize our use of resources and to continue our traditions of outstanding symposia and publications. I'm truly looking forward to the next two years of working with them and with you to make WDA an even better organization

# THANKS

From Norman & Janet Moore

It was a lovely surprise to get your greetings from Beechworth. Thank you all so much. Needless to say we would have loved to have been with you. We have the happiest of memories of visits to Australia in the past, and hoped we might be able to return and, if possible, to observe *Hemiphlebia* in the wild. We look forward very much to hearing whether you found this most exciting insect – if you did, we shall be green with envy! Meanwhile we shall enjoy pond and its inhabitants, warmly encouraged by your kind good wishes.

From Jill Silsby

It is difficult to describe the warm feeling I experienced when I read the GREETINGS received from all those members and friends who attended the Symposium in Beechworth, Australia. To know that I was in your thoughts whilst you participated in the many and varied activities that had been arranged for you made me very happy indeed. I promise, *anno domini* permitting, that I will come to the next one – in Spain. I shall never forget the happy hours Ronnie and I spent in 1994 with Ian and Margaret Endersby finding examining and photographing *Hemiphlebia mirabilis* in Wilson"s Promontory.

# The Third WDA International Symposium of Odonatology

## Mike May & Philip Corbet

The International Symposium of Odonatology held at Beechworth, Victoria, Australia from 7 through 13 January 2003 served as the third such gathering of the Worldwide Dragonfly Association. The first WDA Symposium was held at Colgate University, Hamilton, New York in July 1999 and the second at Gällivare, northern Sweden in July 2001. Accounts of these two Symposia appear, respectively, in AGRION 4:5-6 and AGRION 6: 3-4. At Beechworth, a small town that was the epicentre of the exploits and eventual incarceration of the 19th-Century adventurer, Ned Kelly, the venue was the International Hotel School, a campus of La Trobe University, the headquarters of which is Bundoora, Victoria. The accommodation was spacious, well appointed and moderately priced, and it offered excellent facilities in an attractive, park-like setting. The meeting rooms were conveniently close to the residential and dining accommodation. A valuable facet of the organization was the comprehensive information about the Symposium's programme and locale available several months beforehand on the WDA website, administered by Rob and Kevin Arnold. The Symposium organizers, John Hawking and Robyn Sharman, ably assisted by Ian Endersby and Kathie Le Busque, had made exhaustive preparations to ensure that the Symposium ran smoothly; so participants could safely give their full attention to the proceedings.

The Symposium was dedicated to three, late, distinguished Australian odonatologists: Tony O'Farrell, Robin Tillyard and Tony Watson. A highlight of the Symposium was the presence, as guests, of Tillyard's daughter, Faith, and her son, Dr Jeremy Evans (from Australian National University, Canberra) who presented an invited talk on his grandfather, being joined by Philip Corbet who spoke about Tillyard's contributions to odonatology. The presence of Faith and Jeremy imparted a special cachet to the proceedings. John Hawking likewise spoke about Tony Watson's contributions to odonatology, and Philip Corbet added some personal reminiscences about this delightful man, whom many odonatologists will last have met in Osaka in 1993, shortly before his untimely death.

The format of the Plenary Discussion Session departed slightly from customary practice in that it comprised two main topics, introduced respectively by John Hawking (altitude zonation of Odonata in rivers) and Mike May (affinities among Gondwanaland relict Odonata). Prodromes for these two topics were published beforehand in the booklet containing the Symposium abstracts. In future, Mike May, the current President of WDA, will replace Philip Corbet as convener of the Plenary Session.

The presentations, both formal and informal, were thought-provoking and informative, and were presented to a high standard. They covered, as usual, a wide canvas, being grouped under eight topics: adult behaviour and physiology (4 presentations); Australian biodiversity and conservation (4); biodiversity and ecology (4); African biodiversity (5); conservation (4); larval ecology and behaviour (4); systematics and biogeography (4); and biodiversity and ecology (3). There was, as usual, a meeting of the IUCN Odonata Specialist Group chaired by Jan van Tol.

The poster display was well subscribed, featuring nine items, encompassing such topics as: flight kinematics; functioning of ocelli in horizon recognition; thermoregulation of adults; adult polymorphism; public perception of dragonflies; surveys in tropical China; and stream communities.

Papers presented under **Adult Behaviour and Physiology** included: prey-object-size selection by foraging adults; ocellar vision for horizon detection; threat behaviour by adult *Rhinocypha*; and the adaptive significance of inheritance of colour morphs in *Ischnura elegans*.

**Contributions to Australian Biodiversity and Conservation** included: status of *Hemiphlebia mirabilis*; dragonfly conservation in the South Pacific and Australasia; biodiversity and ecology of dragonflies in Victoria; and anecdotes about enigmatic Australian species.

**Biodiversity and Ecology** included: dry-season Odonata in Peruvian rain forest; distribution of species assemblages in Turkey; biodiversity indicators and dispersal in agricultural landscapes of southern Sweden; and modelling habitat quality for *Coenagrion hastulatum* in The Netherlands.

**African Biodiversity** included: for East Africa, papers on distribution and conservation issues, and progress towards an identification manual; for Namibia, distribution in space and time, and factors bearing on the dichotomy between migration and dry-season residency in desert ponds; and for South Africa, development of a relational spatial database for mapping.

**Conservation** included descriptions of conservation status and assessment for odonate faunas in Hong Kong, The Netherlands (*Calopteryx*), Kerala and the Western Ghats, and Europe.

**Larval Ecology and Behaviour** included: a review of ballistic defaecation in the context of chemical communication; agonistic behaviour; and the natural history of *Petalura ingentissima*.

**Systematics and Biogeography** included: plans to construct a provisional phylogenetic tree for Odonata; Platystictidae of South-east Asia; and the Dragonfly Monitoring scheme in The Netherlands.

**Biodiversity and Ecology** featured: hibernation ecology of *Sympecma paedisca*; a new species atlas for The Netherlands; and autecology of *Aeshna viridis*, including the reported association between this species and *Stratiotes* in The Netherlands.

The Symposium was attended by about 54 primary participants, 14 being accompanied by family members, from about 14 nations, namely Australia, Austria, Canada, Germany, Hong Kong, India, Japan, South Africa, Spain, Sweden, The Netherlands, UK and USA. The nation represented by the most participants was, appropriately, Australia (11), followed by UK (9) and USA (8), followed in turn by Germany and The Netherlands (6 each). The age-spectrum was encouragingly wide, with a broad frequency peak around age 30-35. The atmosphere was, as at the first two WDA Symposia, consistently warm and friendly, being enlivened by the active exchange of information and ideas among participants.

The Symposium provided ample opportunities for the Boards of Trustees, old and new, to conduct WDA business. Philip Corbet (President) and Dorothy Gennard (Treasurer) left the Board of Trustees and David Fitch (Treasurer) and Dennis Paulson joined the Board. The Biennial General Meeting, which was well attended, was chaired first by Philip Corbet and then by the incoming President, Mike May; Valerie Pritchard and Richard Rowe kindly acted as Minute Recorders. Both kinds of meeting were characterized by WDA's commitment to democratic procedures and to respect for the Constitution. Proceedings were interrupted when those present stood in silence for two minutes to mark the passing of Ronnie Silsby, a member held in affection and high regard who died in 2002. During the BGM the appetite of members was whetted by accounts by prospective organisers of the locales of the next two WDA International Symposia, namely Vigo, Spain in 2005 (organised by Adolfo Cor-

dero) and Windhoek, Namibia in 2007 (organised by Andreas Martens and Frank Suhling). WDA owes a great deal to members willing to mount international symposia.

# WDA 3rd Biennial General Meeting held at Beechworth, Australia on 12th January 2003

The full minutes of the 3rd Biennial General Meeting and the Biennial General Report containing the officer's reports are available on the Society's website. If any member cannot access the website and would like to see a copy of the minutes or the report at this time please contact the Secretary. The following is an abbreviated version of the main points of the meeting:

The 3rd BGM at Beechworth was attended by 48 members including 6 members of the Board; the meeting was chaired by Philip Corbet, the outgoing President.
Those present accepted the minutes of the 2nd BGM held at Gällivare on 24th July 2001 as a correct record.

- In his report the president confirmed that WDA had been fortunate to acquire Professor E.O. Wilson, FRS as its Patron and the meeting sent respects and good wishes to Professor Wilson.
- The officer's reports had been circulated before the meeting as the Biennial Report and there were no comments from the floor. Verbal reports were given by Yoshitaka Tsubaki on behalf of Kazunori Higashi, the WDA's Japanese representative, and by Peter Allen, the UK representative. Philip Corbet thanked Vincent Kalkman & K. D. Dijkstra for organising the very successful regional meeting in Leiden in 2002.
- Mike May, as incoming President, proposed a motion to change the Constitution to allow the immediate Past President to remain as a member of the Board. (See the attached postal ballot to this effect.) The meeting unanimously agreed to support this amendment to the Constitution.
- Philip Corbet asked the meeting to remember WDA members who had died since the last BGM. Members stood in silence for 2 minutes as a mark of respect and affection for the late Ronnie Silsby
- The current board were discharged and Philip Corbet handed over the chairmanship of the meeting to the new President, Mike May.
- All the nominees for the incoming Board were accepted and so it is constituted as follows:

| | | | |
|---|---|---|---|
| President: | Mike May | e-mail: | may@aesop.rutgers.edu |
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| Symposium Committee Chairman | Gordon Pritchard | | gpritcha@ucalgary.ca |
| Trustee | Dennis Paulson | | dpaulson@ups.edu |

- Mike May, as the new WDA President, said he felt fortunate to have the advice of two past Presidents and the support of an able and enthusiastic Board of Trustees. He said he recognised that there are challenges ahead but also exciting and interesting opportunities for odonatology. He thanked the membership for electing him as president.
- Adolfo Cordero gave a presentation featuring pictures and the music of the Pontevedra region of Spain where the 4th WDA International Symposium will be held in July, 2005. (Full details will be published in *AGRION* and on the website as they become available.)
- Frank Suhling then transported us to the very different location of Namibia. On behalf of Eugene Marais the Curator of the National Museum of Namibia, Windhoek, an invitation was extended to the WDA to hold its 5th Symposium there in 2007. Members unanimously accepted this invitation in principle.
- It was proposed and agreed that WDA strongly support, in principle, the Global Dragonfly Assessment under the auspices of IUCN and WDA (this refers to a world-wide database being set up country by country as recommended to the Symposium by Mike Samways)
- The meeting was unanimous in thanking John Hawking, Robyn Sharman and Kathie Le Busque for all their hard work in organising the 3rd WDA Symposium.

The next BGM will take place in Vigo, Spain in 2005 at a date and time to be arranged.

# SUMMARIES OF BOARD OF TRUSTEES MEETINGS AT BEECHWORTH

## *Philip Corbet & Mike May*

The Board of Trustees met twice during the 3rd WDA Symposium on the Latrobe University campus in Beechworth, Australia.

**The 7th Board meeting**, on 8 January 2003, was attended by 6 members of the current, i.e., 2001-2003, Board (present: Linda Averill, Viola Clausnitzer, Philip Corbet, Mike May, Gordon Pritchard, Frank Suhling) and two WDA members in attendance by invitation: Past President Mike Parr and Symposium Organiser John Hawking. The President (Philip Corbet) chaired the

meeting. The Board decided unanimously: (1) that the current practice whereby the President views pre-publication proofs of AGRION shall continue; (2) that at WDA Symposia an extra charge will be levied for attendance by non-WDA members, for late registration, and for cancellation; (3) that Gordon Pritchard and John Hawking be thanked for their parts in organising the Beechworth Symposium; (4) that John Hawking's offer to supply a CD containing guidelines for symposium organisation be gratefully accepted; (5) that the Board endorse Mike May's intention to seek to change the Constitution so that the Past-President remains on the Board; and (6) that the responsibilities undertaken by Board members be reviewed forthwith and thereafter at 6-year intervals.

**The 8th Board meeting** was held on 13 January 2003, a day after the Biennial General Meeting (present: Linda Averill, Viola Clausnitzer, Mike May, Dennis Paulson, Gordon Pritchard, Frank Suhling: attending by invitation: Philip Corbet). The following actions were approved unanimously: (1) that AGRION hereafter shall be made available upon publication on the WDA secure website and that members who wish to receive a hard copy by mail must request that option from the Secretary; (2) that a biennially awarded prize of not less than $US/Euro 200 for a student conservation project be established; (3) that the Board investigate the possibility of increasing funds available for conservation projects, since the financial picture for WDA appears to be improving and that the Treasurer be requested to prepare a statement of funds available for the work of the CFC; (4) that applicants for sponsored membership be required to give evidence of their continuing interest in Odonata and to nominate a WDA member who will recommend their application (sponsored members may also be recommended by any member of the WDA); that applications must be made initially to the WDA Treasurer, be approved by the Board, and be renewed annually at the discretion of the Board; and that sponsorship does not include a journal subscription, although sponsored members may receive IJO upon payment of US$10; (5) that a presentation of details of membership figures and trends be made at the next BGM and that Linda Averill will write a short piece about it for an upcoming issue of AGRION. The Secretary, Linda Averill, informed the Board that administration of mailing/membership lists, hitherto handled by Wolfgang Schneider, will become a function of the Secretary in 2003. Wolfgang Schneider has given notice that he will be unable to continue to administer the WDA Euro account held in Germany after mid-2005; resolved that he will be asked to nominate a successor, and that an appeal for a volunteer to take charge of the fund will also be made through AGRION.

The next meeting of the Board was provisionally set for the 4th Symposium in Spain in July 2005.

# Beechworth 2003 – a personal (more social) retrospective

## *Gordon Pritchard*

It was over 40ºC when a representative of the Beechworth Bus Lines met us at the Albury Railway Station on 7 January. This boded well for Valerie, who wants to be a lizard in her next life, but I was a little apprehensive. Fortunately, the furnace-like conditions did not last and we were to spend the next 11 days basking in daytime temperatures in the low 30s.

The 3rd WDA International Symposium of Odonatology, ably organized by John Hawking and Robyn Sharman with considerable assistance from Kathy Le Busque, was held at the May Day Hills campus of La Trobe University. Set in extensive and beautiful grounds, the campus provided a perfect venue for the meeting, made perhaps even more appropriate, some might say, by the fact that in its former life it was a hospital for the insane. There was even a water feature on the campus, seemingly always with an odonatologist (usually Kiyoshi Inoue) in attendance, that yielded, along with Lake Samball and the Chinese Garden in town, adults of 16 species of Odonata (*Austrolestes leda, Austroargiolestes calcaris, Austroagrion watsoni, Ischnura aurora, I.heterosticta, Xanthagrion erythroneurum, Telephlebia brevicauda, Aeshna brevistyla, Hemianax papuensis, Austrogomphus guerini, Synthemis eustalacta, Hemicordulia australiae, H.tau, Diplacodes haematodes, Orthetrum caledonicum, O. villosovittatum*).

**Pre-Symposium Tour - Beechworth Environs**

Wednesday January 8th provided a gentle introduction to the Symposium with morning and afternoon tours of Beechworth. The morning tour took us by bus down into The Gorge below town. The area has many reminders of the goldfields, which made Beechworth famous during the 1850s and 60s. In a space of 15 years, 115 tonnes of gold were recovered from the creeks in the Beechworth area. On our day only six species of Odonata were recovered from Reid Creek and the head of Woolshed Falls, but *Synlestes weyersii, Austroargiolestes icteromelas, Nososticta solida* and larvae of *Austroaeshna unicornis* and *Notoaeschna sagittata* were new to the Beechworth list above. Perhaps had we had the same number of collectors in 2003 as there were miners 150 years previously (8000 of them) we might have had more impressive numbers. But it was apparent that the drought Australia has been under for several years is having a significant effect on odonate populations.

Lunch was taken in the Beechworth Bakery, which, in spite of (or perhaps because of) the advertisement that there were 130 more seats upstairs, was packed to the gills. The afternoon tours of the town covered the cultural history, with visits to the beautifully preserved granite buildings associated with the gold era and with Australia's most famous outlaw, Ned Kelly. I first became interested in Ned when I lived in Sydney in the 1960s and I was more than ready to see the lock-up where Ned was held while on trial, the Beechworth Courthouse where he was tried in 1870 for receiving a stolen horse and ten years later for murder, and the Beechworth Gaol, which is still in use, and where Ned served time either for the horse receiving charge or an assault charge (unfortunately, every brochure we received had a different story of Ned's life). Later in the trip Valerie and I visited the Old Melbourne Gaol where 26-year-old Ned spent his final days before being hanged there in 1880.

**Some Evening Entertainments and the "Partners" Programme**

There was no excuse for getting bored at this Symposium: John and Robyn had something for us to do virtually 24 hours a day

Unfortunately, a cold front that blew in, seemingly straight from the Antarctic, marred **Wednesday evening**'s barbeque by the pool on campus. But this was forgotten by the next morning as the Opening Ceremonies got the Symposium underway. The ceremonies were enlivened by the singing of some good old Australian songs by Lazy Harry and by the presence of R.J. Tillyard's daughter Faith (Duchy) Evans and her son Jeremy, who entertained us with some recollections of his grandfather's

life. **Thursday evening** started with a wine and cheese reception at the Albury Regional Museum where Philip Corbet officially opened a Dragonfly Exhibition. The exhibit, organized by John Hawking's daughter with just a little help from her father, featured hands-on modules and live larvae, and gave the visitor an excellent introduction to many features of Victoria's dragonflies. After viewing the exhibit we walked along the Murray River to the Botanic Gardens, where we had a very informative guided tour followed by a barbeque dinner put on by the Friends of the Gardens.

On **Friday** Robyn took the Partners back to Albury for a tour of the historic sites. War Memorials are dominant features of every Australian town and the one in Albury is no exception. Also included was the Ettamogah Pub, a phenomenon based on a cartoon strip, replete with signs such as "Free Beer Tomorrow" and "Beware of the Agapanthus." Incidentally, *Agapanthus* blooms, both blue and white, were everywhere in Victoria's gardens, providing cool beauty wherever we went.

The Symposium Dinner was held at the Lake Hume Resort on **Sunday evening**. Once the air-conditioning was turned down we enjoyed excellent food accompanied by the fine Australian wines that we now were almost taking for granted

In case the Partner's felt that they had been inadequately wined and dined up to this point, Robyn took them to the Milawa Gourmet Region ("The Culinary Crossroads of Victoria") on **Monday**. I gather that the highlights included visits to Brown Bros. Vineyard & Epicurean Centre, Milawa Mustards, and the Milawa Cheese Company & Bakery, where more than 20 cow's and goat's milk cheeses were available for tasting in season. Unfortunately, The Milawa Goat's Camembert – the runner-up in the Grand Dairy Awards in 2002 and a cheese "for the mild white mould fancier" – was not available. Nor was the Milawa Chèvre – "a fresh, sharp acidic cheese with a subtle goat flavour" that was Champion Cheese at the 1996 Melbourne Show. After lunch the party visited the old mining town of El Dorado, whose top tourist attraction is the largest dredger in the Southern Hemisphere, an awesome machine that "treated" over 27 million cubic metres of creek-bed between 1936 and 1954.

**Mid-Symposium Tour - Kiewa River**

One of the many nice things about this Symposium was the information with which we were provided, either on the Association's web page prior to the Symposium or in our registration package at the Symposium. Included in the latter was a guide to the treatment of snake bites and Gunther Theischinger's & John Hawking's 'Dragonflies of Victoria', which was constantly being consulted by the Northern Hemisphere collectors as they tried to come to terms with the strange fauna. In addition, we had John Hawking's & Tim New's paper on the distribution of Odonata along the Kiewa River, which provided the background for the mid-symposium tour on Saturday 11 January. The trip was in some doubt almost up to departure time as the route was threatened by bush-fires. However, they held off for a day and we were able to go as scheduled. The collectors had the opportunity to go to work at five of John's & Tim's 16 localities along the river, ranging in altitude from less than 200m at Kergunyah not far from the river's junction with the Murray to almost 1600m near to the source in the Bogong High Plains.

I was more interested in photographing the scenery, road signs ('Wombats Next 1km'), country stores, and billabong swimming holes than in collecting, which I gather was a wise choice as pickings were slim; certainly nowhere near the 34 spp. collected by John & Tim 15 years earlier, although they did spend a lot more time on the river. The scenery, however, was spectacular, from the tall eucalypt lowland forests, through the snow gums, to the tree-less, but certainly not flora-less, high plains. The excellent day finished with dinner and beer *al fresco* on a warm summer evening at the Yackandandah Hotel.

**Post-Symposium Tour**

Forty happy souls assembled on Tuesday January 14th for the five-day tour that would take us through east-central Victoria from Beechworth to Melbourne. Our first stop was at the aboriginal site at Yeddonba balai ('Pine tree walk'), where we scrambled up amongst the rocks to see the petrographs (our only Tasmanian Tiger sighting) and get a splendid view of the surrounding, but very brown, countryside. By mid-morning we were in Chiltern, Robyn's childhood town, and the collectors had 45 minutes to come up with adults of four species and exuviae of another three, although only *Diplacodes bipunctata* was new. The bird-watchers had more success.

'Sydney may have a nice harbour but Rutherglen has a great port' according to the sign in the town where John grew up. And indeed it did, as we sampled the fare at Campbell's winery, with its rich muscats and the famous 'Empire Port', and then enjoyed our sandwich lunch in the Winery's garden.

Next stop was the Mulwala Museum, just over the border into NSW. 'All persons having goods in their possession and about to enter the colony of New South Wales must first report at the Customs House' says the 1894 sign on the Victoria side of the bridge over the Murray. With its mainly early 20th century collection of rural Australian memorabilia, Ulf Norling said that the Museum reminded him of the High River Museum, south of Calgary. Back on the Victoria side, collecting was scheduled for the Lake Mulwala foreshore in Yarrawonga where, despite the howling gale, adults of two Zygoptera (*Ischnura heterosticta* and *Xanthagrion erythroneurum*) were procured along with exuviae of *Hemicordulia tau*. Given the poor conditions, the collectors repaired to the sheltered valley of the Murray below the Yarrawonga weir, although only one species (*Nosostica solida*) was taken alive there along with exuviae of the ubiquitous *Hemicordulia tau*. The wiser members of the party who were not lured by the vision of odonatological riches stayed by the lake and finished off the birthday cake we had enjoyed at afternoon tea (I'm sorry but I forget whose birthday it was) [Jan van Tol's – Ed.] and watched the antics of a flock of galahs. For those not familiar with Australian birds, the galah is a beautiful, gregarious, pink and grey cockatoo that apparently fed early settlers. The preferred method of cooking was by boiling the bird in a billy of water to which was added a small stone. When the stone was soft, the galah was ready to eat.

On Wednesday 15th we drove up into the Warby Ranges and made our first stop among a clump of Grass Trees (*Xanthorrhoea australis*: from the Greek *xanthos* = yellow and *rheo* = to flow, a reference to the resin that is obtained from these strange plants). They look exactly as their common name describes them, but their closest relatives are apparently in the Liliaceae. They had many uses for the aboriginal people, from making spears and fire drills to food and adhesives.

Our next excitement was an echidna at the side of the road spotted from the bus. Despite the best efforts of our intrepid leader wielding a large stick, my photographs are of a blurred creature rapidly disappearing into the soil at the base of a tree.

Then it was on to Glenrowan, the site of Ned Kelly's capture, for more cultural history, before the collectors could be unleashed on the King River at Gentle Annie Lane in Whitfield. This turned out to be a goldmine as nine species were taken as adults and another as exuviae. Unfortunately, I can't report on what made the site so productive: I was tasting the fare at the Pizzini Winery.

Stringybark Creek was the place where the Kelly gang shot three members of the Victoria Constabulary - an event which led to the manhunt that finally ended in Glenrowan. One of my favourite photographs from the trip is of Mike May, wielding not a gun but a very large net at this spot. Unfortunately there was nothing in the net because the creek was pretty dry, although *Austroaeshna multipunctata* was taken on the wing and a larva of *Telephlebia brevicauda* was dug out of the mud.

The next day, Thursday January 16th, was the day that had brought us all to Australia, as we were promised the sight of Australia's most famous and only officially endangered odonate, *Hemiphlebia mirabilis*. Expectations were high as we got off the bus in Yea. Some even missed morning tea in order to get a headstart on the quest for the grail. In an hour and a half's collecting, six species were taken as adults and one as larvae but, sadly, *H. mirabilis* was not among them. Perhaps Watson, Theisinger & Abbey's (1991) statement: "[*H. mirabilis*] is known only from a small set of swamps on Wilsons Promontory" is still correct.

Our picnic lunch was taken at the Snobs Creek Fish Hatchery where we had the privilege of viewing the magnificent Murray Cod in captivity. The collectors then set some sort of record in taking nine species (seven as adults, two as exuviae) from the small ponds in half an hour. After this my memory becomes a little fuzzy but, according to the collecting notes kindly provided to me by Ian Endersby, we stopped at the Goulburn River at Alexandra (perhaps there was another winery there for the non-collectors) where adults of seven species were taken, before driving to Marysville where we were to spend the last two nights of our trip. The main attraction in Marysville is the falls on the Steavenson River, which are floodlit at night. We viewed them both at night and in daylight. Personally, I preferred the day-lit alternative, as I'm sure did the collectors who took five species from the river, including *Austroaeschna atrata* and *Eusynthemis guttata*.

The highlight of Friday 17th was a trip to the Healesville Sanctuary, which provided close-up encounters with 200 species of Australian wildlife, from Brolga cranes and Red-tailed Black Cockatoos to Koalas and one very unhappy Tasmanian Devil. After that I think we drove up through the magnificent gums and groves of tree ferns in the Yarra Ranges National Park. I certainly remember the drive but not exactly when we did it. I blame Valerie for this, because the diary she promised to keep did not get past the first few hours of our trip (which started in Singapore).

After the group photographs taken outside the hotel on Saturday morning we took a leisurely drive to Melbourne, stopping at a couple of collecting sites but Ian's notes show no collections. Perhaps he, like John and Robyn, was looking forward to sleeping in tomorrow without having to think about looking after the rest of us, who were now beginning to take being looked after for granted. We had been thoroughly spoiled for the last two weeks, and we really didn't want to get off the bus in Melbourne. I have not been able to establish contact with John since then. If he survived and is reading this, then I hope our appreciation for everything he, Robyn, Kathy, Ian, Peter & the other drivers with Beechworth Bus Lines did for us comes through. If he didn't survive, then he can rest assured that it was a job well done, and when we meet up again in the next life we'll have a glass or three of Shiraz, or Empire Port, or Toohey's Old, and talk about **the good times that were Beechworth 2003**. What we won't mention is that, of the 80 species on the Theischinger & Hawking (2003) list, only 32 were collected during the Symposium and that the Symposium emblem, *Austropetalia tonyana*, seems to exist only on the Symposium emblem.

# A pleasant journey that made me acquainted with Brazilian odontatologists as well as dragonflies – Hidenori Ubukata

The odonate fauna of northern Japan is rather like that of Europe. To visit an ecosystem with a hot, rainy climate in the southern hemisphere is the dream of any odonatologist who has grown up in this northern cool climate. My dream came true when I visited Brazil in late 2002 to study the ecosystems and environmental education of this huge country. During my stay I made a circular trip from São Paulo through the cities of Bonito, Campo Grande, Cuiabá (Mato Grosso State), Manaus (Amazonas State), and to São Paulo again, as well as short trips to the Ecological Stations of Jataí, Jacareí (São Paulo State) and Rio de Janeiro, which gave me a chance to see nearly all the active odonatologists of the country and to examine many dragonfly species, alive or as specimens.

For two months I stayed, as a visiting researcher, in the Department of Hydrobiology, Federal University of São Carlos, which is located in the city of São Carlos ca. 240 km northwest of the city of São Paulo. My field trips around São Carlos were kindly guided by Ms Patricia S. Ferreira-Peruquetti, a postgraduate student studying odonate ecology under the supervision of Professor Alaide A. F. Gessner. Alaide is one of the leading chironomid ecologists of the country, and it was through his courtesy that I enjoyed life as a guest researcher of the University.

My short excursion into a Cerrado grove adjacent to the campus guided by Patricia and her husband, Rui C. Peruquetti, a hymenopteran ecologist, resulted in my first contact with Brazilian dragonflies as well as a communal nest of a social spider (*Parawixia bistriata*): *Macrothemis, Argia*, and a protoneurid at a streamlet, and *Erythrodiplax latimaculata* and *Tramea binotata* by a reservoir.

Ecological Station of Jataí, a nature reserve in Luiz Antônio of São Paulo State, was another place that Patricia and Rui took me, I watched there *Diastatops intensa* (what a remarkable contrast of black and red on the hind wing!), *Planiplax machadoi*, *Erythemis mithroides, E. credula*, etc. at a dam of Beija Flor stream, also I gazed at *Heliocharis amazona* (Dicteri-

adidae), *Neoneura sylvatica* (Protoneuridae) at an out going stream of the dam. *Miathyria marcella* and *Erythemis mithroides (again)* were also seen in this Nature Reserve.

During my circular trip of 17 days from late October to mid November, I saw many dragonflies especially in the enormous wetland of Pantanal and at 'igarapés', inlets of the Amazonian river system. Sadly, however, I couldn't identify them even to generic level because Brazilian law prohibits foreigners either collecting insects or taking them out of the country. Nevertheless, I enjoyed enormous pleasure from watching those unidentified beautiful creatures flying in the tropical biotopes. Towards the end of this circular trip, I visited National Institute of Amazon Research (INPA) situated in the city of Manaus and saw some odonate specimens in the Entomological Laboratory curated by Dr Augusto L. Henriques. Among those specimens, I was deeply impressed by arrays of the specimens of pseudostigmatids which had very long abdomens and beautiful wings. An even more interesting experience for me was a conversation with Dr Hugo G. Mesquita, an odonatologist, who was responsible for managing the five nature reserves INPA possesses. He talked to me: "One of these reserves, around a tributary of River Negro, undergoes large seasonal changes in water level of the river, so the animals, as well as plants, have had to adapt to this dynamic change. Dragonflies were also interesting in this context. The most abundant species are *Zenithoptera lanei* (Libellulidae), *Diastatops pseudobscura* (Libellulidae) and some species of Protoneuridae. The phytotelmata dwellers, such as *Mecistogaster lucretia*, and *Microstigma maculatum* are bioindicators of forest ecosystems. *Chalcopteryx rutilans* (Polythoridae) disappears due to a slight modification of a forest. Upstream, in highland forest, the most abundant species belong to umbrophilous genera *Uracis* (Libellulidae), but several species of Zygoptera are predominant."

In late November I visited the city of Jacareí, southern São Paulo State to see Mr. Frederico (Fred) A.A. Lencioni, a young energetic odonate taxonomist. A room of a modern condominium was his private laboratory housing his well curated odonate collection, where he showed me specimens of: *Leptagrion perlongum* (a coenagrionid with long abdomen), *Heliocharis amazona* (long legged dicteriadid), *Idioneura ancilla*, five spp. of *Heteragrion* (materials for Fred to write his doctoral thesis) and an undescribed species of *Mnesarete* (Calopterygidae), *Mnesarete pudica*, *Tigriagrion aurantinigrum* (this coenagrionid genus is monotypic and confined to South America).*Oxyagrion santosi* (also endemic to SA), *Telebasis haematinum, T. willinki*, *Lestes bipupillatus*, *Forcepsioneura garrisoni* (new genus and species described by Fred), *Neoneura sylvatica* (Protoneuridae).

On the next two days Fred guided me to a secondary but beautiful Atlantic rain forest which critically remains in the suburb of Jacareí. Here I saw a couple of *Idioneura ancilla* (Protoneuridae), *Telebasis limoncocha, Acanthagrion ascendens,* and *Tigriagrion aurantinigrum*. We were extremely fortunate in being able to observe *Mecistogaster asticta* ovipositing.

Then I continued my trip to Rio de Janeiro. Next morning, seeing blue waves along the beach of Ipanema on the right side, I was guided by Dr Alcimar d. L. Carvalho, an active odonate taxonomist and a musician too, to the Tijuca National Park, where we saw *Libellula herculea*, *Orthemis discolor, Castoraeschna castor*, *Argia sordida*, *Ischnura capreola* and *Acanthagrion gracile.* Then we moved to the Botanical Garden of Rio de Janeiro and saw therein *Macrothemis hemichlora, Perithemis mooma* (a common species) and *Hetaerina* sp.. Alcimar is a good photographer and gave me a beautiful photograph of *Mecistogaster asticta* just the day after my first encounter with a live individual.

The following day I visited the National Museum of the Federal University of Rio de Janeiro and met Professor Janira M. Costa, the present head of odonatology and was able to examine the huge odonate collection of the late Dr Newton D. dos Santos. The Museum's odonate collection is perfectly curated by her and work on an electronic retrieval database is nearing completion. Although I'm neither a taxonomist nor a morphologist, Janira kindly showed me specimens representing almost all the odonate families of the region. Among these, the following made me take notes: *Hetaerina amazonica, Mnesarete pudica pudica* (Janira wrote a paper on the speciation of this species group), *Dicterias atrosanguinea* (dicteriadid representative from Amazon, with long legs), *Perilestes solutus* (Perilestidae with short wings and long abdomen), *Heteragrion ovatum* (Megapodagrionidae), *Epipleoneura machadoi* (Protoneuridae); *Mecistogaster amalia* (common in Rio), *M. linearis, M. lucretia* (Amazon), *M. ornata* (female with yellow wing tips), *Megaloprepus caerulatus* (Pseudostigmatidae, with dark band on the wing, from Colombia,); *Castoraeschna* sp.*, Staurophlebia* sp.*, Remartinia luteipennis* (Aeshnidae); *Phyllocycla diphylla* (Gomphidae); *Navicordulia errans* (Brazilian genus, separated from *Dorocordulia* by Machado & Costa (1995)), *Santosia machadoi* (blue metallic colour), Allotype, Corduliidae); *Uracis imbuta* (common in Brazil), *Ypirangathemis calverti* (small), *Zenithoptera anceps* (with short abdomen and dark brown wings), *Perithemis mooma; Coryphaeschna perrensi* (exuviae and larvae, Aeshnidae). Recently she has written monographs on Amazonian Odonata.

I thank all the friends mentioned above for their kind guidance and assistance while I was in Brazil. Accounts of many of the trips can be seen at: http://sci-edu.kus.hokkyodai.ac.jp/brazil/.

## WHAT TO DO WITH AN UNWANTED SWIMMING POOL – TURN IT INTO A DRAGONFLY POND – Jan Taylor, Perth, Western Australia.

When looking for a new house for our family 18 years ago, one of the requirements we set was that it should not have a swimming pool – if the boys wanted to swim they could go to the beach, or friends houses. After months of frustration and disruption to the family we moved into our new home – and, would you believe, it was blessed with a large concrete swimming pool! Every house we looked at which remotely suited our needs had one of these expensive, time-consuming additions. We could of course have filled it in, but having got one, at least the children could use it while they were at home – so it stayed, and I became a slave to the job of keeping it going. A magnificent lemon-scented gum tree grew next door. It had smooth white bark, pinkish soon after it shed the outer layer and delicate foliage which was home to all the birds in the neighbourhood – warbling Australian Magpies, Grey Butcher Birds, Red Wattlebirds, Doves, Rainbow Lorikeets, Kookaburras to name a few. Unfortunately it dropped everything in a continual rainstorm of leaves, buds, flowers, gum nuts, sheets of bark, twigs, even branches. There was much too much for an automatic cleaner to handle, especially the twigs and bark. The bird-

life also left their marks on the bottom – especially the ravens and magpies – a roosting ibis also left particularly large bye-products in the pool. During the day I was frustrated by the Twenty-eight Parrots (their call sounds like their name), which spent hours in the branches eating gum nuts and dropping bits into the pool, where they formed brown stains on the bottom.

The boys grew up and left home and after a few years, one autumn, I said: "I have had enough! It is going to become a dragonfly pond, regardless of whether it affects the value of the house." Not surprisingly, there are no directions on how to do this, but at least I knew about dragonflies – they have been a passion since I was a schoolboy. What I did first was change the water to get rid of chemicals used for treating the pool – and filled it again from the bore. Luckily we have good clear, limestone groundwater which we use to water the garden and top up the pool. I knew that at this stage it was very important to stock the pond with pond life as soon as possible to make it 'balanced', otherwise it would go green. I went to local lakes and rivers and scooped up mud and weed, and all the crustaceans and insect larvae I could find. It needed: water-filterers, such as water fleas and mussels; grazers, such as water snails; detritus feeders, such as crayfish and water skaters; predators, including water beetles, water stick insects, dragonfly nymphs, water boatmen and so on; and microbes – a wide mix of bacteria and protozoa.

The water remained crystal clear – not even a hint of green, but the bottom became clothed in a beautiful veil of filamentous alga – eventually I thought it too much of a good thing and pulled it out – it never grew again. There was a moment of panic when I found huge numbers of mosquito larvae in the water. These mosquitoes bite, so something had to be done quickly. I did not want to keep fish, because they eat dragonfly nymphs, but as a temporary measure I caught about 100 mosquito fish (*Gambusia*) in a brook and put them in. That quickly cured the mosquito problem, and I re-caught the fish a couple of months later and replaced them with a large number of water boatmen. I brought in reeds, mainly Reedmace, and water-lilies which I planted in pots and sank to the bottom. The lilies grew strongly and soon reached the surface, even from the 2.5 metre deep end.

In the spring the first dragonflies came – they clearly approved of what I had done, from then on there were always some patrolling the water. I saw several laying eggs, including the beautiful large red *Trapezostigma stenoloba*, which I have rarely seen near water – nine months later several were emerging every evening. Damselflies also appeared, weaving in and out of the reeds, and I introduced others from local lakes. Over the years the dragonflies increased and were a constant feature of the pond for most of the year. Three other species bred (*Hemianax papuensis*, *Hemicordulia australiae*, and *H. tau*), *Orthetrum caledonicum* and *Diplacodes haematodes* and *D. bipunctata* visited, but did not appear to breed, and *Aeshna brevistyla* was an occasional visitor. Of the damselflies *Ischnura aurora* bred regularly, and I was able to establish a colony of *Austroagrion cyane*, while *Austrolestes annulosus*, *A. io*, *A. analis* and *Xanthagrion erythroneurum* were visitors. The lilies flourished with more than thirty blooms on the surface at times – pink, yellow, blue and white. We would sit in the shade of the grapefruit tree, watching dragonflies patrolling, and happily observe parrots in the tree above dropping gum nuts into the pond – they were providing a valuable resource, to feed the thriving pond life! Frogs found the pond to their liking too, Motorbike Frogs, Banjo Frogs and Slender Tree Frogs all spawned, with young tree frogs later playing leapfrog up reed stems – once I counted thirty in a row up a reed!

All good things come to an end. We decided we needed a change, for various reasons, perhaps a smaller house, which would be easy to lock up and leave, to explore remote parts of Australia or visit family in England and New York. The house went on the market, and we hoped we could find a buyer who would value our lilies and look after our little ark of pond-life. The house was soon sold (or so we thought) but we were dismayed to learn that it was subject to the condition that we turn the pond back into a swimming pool! (I think the purchasers were not sure that it could be done – I was not sure how expensive it might be.)

So, in plenty of time before settlement, the lilies were sold, and the pond emptied (tadpoles, nymphs and other pond life were put in a small pond in the front – a night heron had a ball!). A few wheelbarrows of sludge were carted out leaving the sides with a deep green layer of alga, and the bottom with dark stains where the pots had rested. I was

relieved to find that I could clean it all off quite easily with pool chemicals – brushing with hydrochloric acid first, scrubbing with water and then brushing with chlorine to bleach it (protective clothing and breathing apparatus are recommended). The only cost was my labour – the chemicals were more than covered by the sale of lilies. The surface came up better than it had ever been before – even the black stained areas on the bottom were whiter than the rest. The pool was sparkling blue again and we could sit under the grapefruit tree admiring the ripples of reflected sunlight playing under the palm fronds and up the smooth white bark of the gum tree, happy that we were soon leaving the new owners with the problem of gum nuts plopping into the water from high overhead.

That was three years ago. We now have another house only a ten minute drive away and – you've guessed it – it has a pool! It is still a swimming pool but I am experimenting with floating plastic ponds within the pool. The pool has no overhanging trees and it is a dream to maintain compared to the other. Even more dragonflies come to this pool – in summer there are usually about four male *Orthetrum caledonicum* chasing and settling around it, and one or two *Diplacodes haematodes*. Visitors include *Hemicordulia australiae* and *H. tau*, which often lay eggs (they tend to lay on any flat surface, even brick paving). Others include *Aeshna brevistyla*, *Hemianax papuensis*, *Austrothemis nigrescens*, *Trapezostigma stenoloba* and I have seen one *Pantala flavescens*. Several species lay eggs in my floating ponds, particularly *O. caledonicum*, *D. haematodes*, and the damselflies *Xanthagrion erythroneurum* and *Ischnura aurora*. We are hopeful that we can keep the pool *and* have my dragonfly ponds.

## BACKYARD DRAGONS – David Goddard

I would like to relate how I first became interested in dragonflies and how this relates to dragonflies in the backyard. I had previously bought a copy of The Dragonflies of Great Britain and Ireland by C.O. Hammond but not made much use of it.

We live on the edge Nottingham, which is the middle of England and the nearest water bodies are about one mile away, these being a small river and a canal. It was 1995 and the beginning of July with just 15 minutes to go before the end of the day at work and I received a phone call from my wife Nadia telling me that my son Timothy had seen a large dragonfly settle in the garden. They had caught it in the bug box and would I please come home a little early to help in the identification of the insect, so off I set being only two minutes walk away from home.

When I arrived home a very excited eight-year-old son showed me the bug box with the impressive insect inside. I got out the book I mentioned above and we leafed through together. It was obviously a hawker type of dragonfly but which one? Eventually, after much deliberation, we decided it was a Brown Hawker *Aeshna grandis and*, having identified it and taken a few photographs, we let it go. We were so impressed that the following weekend we had to go to a local nature reserve to find more dragonflies and since then my enthusiasm has grown and grown. Under the prompting of my son a couple of years later I was persuaded to build a pond in the garden, which has attracted a considerable amount of wildlife but not so many species of dragonfly unfortunately. So far we have recorded five species of dragonfly, namely the Brown Hawker *Aeshna grandis* mentioned above, Migrant Hawker *Aeshna mixta*, Southern Hawker *Aeshna cyanea*, Common Darter *Sympetrum striolatum* and Ruddy Darter *Sympetrum sanguineum*.

# R.J. Tillyard FRS (1881-1937): a giant among odonatologists[1] – Philip Corbet


### ABSTRACT

No scientist has contributed so much to odonatology, across so broad a front, as Robin John Tillyard, FRS (1881-1937). He contributed extensively to basic knowledge through his own research, primarily in the fields of functional morphology, taxonomy, embryology, ontogeny and phylogeny. He contributed to the science of odonatology and to odonatologists through his book, *The Biology of Dragonflies* (1917), the first book to treat the biology of the order Odonata as a whole, and a masterly and inspiring synthesis of contemporary knowledge. The debt owed by odonatologists to Tiltyard is incalculable.


In 1989 I prepared a brief historical review of odonatology in which I recognised six strands of the science since the Renaissance (2). I called these strands, respectively, the Exploring, Codifying, Classifying, Integrating, Intercommunicating and Conserving strands. Each strand has a beginning but not an end. Once started, each continues as part of odonatology, which thereafter expands and is enriched accordingly. R.J. Tillyard contributed much to several of these strands but may be said to have been the founder of the Integrating Strand. I defined the Integrating Strand as "the integration of knowledge from all known fields to construct a picture of the biology of the Odonata as a group, worldwide." Tillyard was the odonatological giant who for the first time drew together existing knowledge of the order in his now classic book *The Biology of Dragonflies*, published by Cambridge University Press in 1917 (24). In this book Tillyard emphasises functional morphology, embryology, ontogeny and phylogeny, fields in which he himself had made major contributions to knowledge and that were fashionable among zoologists during his lifetime. Only one of the book's chapters (entitled "Bionomics etc.") treats natural history. Though this chapter contains relatively little information about ecology and behaviour, it whets the appetite wonderfully, even now, 85 years after it was written. From our perspective today, this lack of emphasis on ecology and behaviour may seem curious, for two reasons: first, Tillyard himself was an excellent naturalist and published many fascinating and original observations about the

[1] Based on an oral presentation to the Third WDA International Symposium of Odonatology, held in January 2003 in Beechworth, Australia and attended by Tillyard's daughter, Faith Evans, and his grandson, Jeremy Evans

habitats and life cycles of dragonflies, for example his pioneer studies on the ecology of Petaluridae (10, 16); and second, by 1917 a good deal of information on dragonfly ecology had already been published in scientific journals by odonatologists such as Calvert (1), Wesenberg-Lund (37) and Needham (6). Perhaps Tillyard found ecology insufficiently precise for his taste.

It is not difficult, however, to put his lack of emphasis on ecology and behaviour into historical perspective. In Tillyard's day both disciplines were little more than a gleam in some biologists' eyes. At best they were in their infancy. One of the earliest journals of ecology, *Ecology*, began only in 1919, and the *Journal of Animal* Ecology not until 1931; *Oecologia* began in 1960, being a derivative of *Zeitschnift für Morphologie und Ökologie der Tiere*, which originated in 1924. *Oikos* began in 1949. Ethological journals began much later: *Zeitschift für Tierpsychologie* (now called *Ethology*) in 1937, *Behaviour* in 1948, *Animal Behaviour* in 1954 and *Behavioral Ecology and Sociobiology* in 1976. Also, despite Tillyard's conspicuous skills as a naturalist, ecology was not one of his priorities. As Tillyard's son-in-law, John Evans, remarked in his comprehensive obituary article (5, p. 28), "Tillyard had no real understanding of ecology," although he was "first and foremost ……a naturalist." (5, p.7).

Tillyard's comments on reproductive behaviour in his book are virtually confined to a brief account of courtship in the Calopterygidae (24, p. 325) and in *Hemiphlebia mirabilis*, (24, p. 326), an interpretation that is now regarded as mistaken (7). Otherwise there is no mention of reproductive behaviour, despite Tillyard's detailed earlier observations about the formation of the unusual tandem linkage and the charging of the seminal vesicle before pairing in *Petalura gigantea* (10) and his much later notes on the pairing of the New Zealand coenagrionid *Xanthocnemis zealandica* (34). To mention this apparent imbalance merely reminds us of how rapidly fashions in science change. In Tillyard's 1917 book adult reproductive behaviour occupies about 1 page out of 362, or 0.28%, whereas in a recent review of dragonfly behaviour and ecology (3) this topic occupies about 135 pages out of 580, or 23.3%, i.e. about 100 times more!

Tillyard's 1917 book transformed the science of odonatology. Its great strengths lie in its treatment of comparative and functional morphology, classification (especially of the Zygoptera) and phylogeny. For these fields this book still provides the foundation that every odonatologist needs to build on. The book constituted a major contribution from another perspective: it allowed odonatologists to feel that their science had come of age, because they now had available a *real book*, devoted entirely to their favourite order of insects. In this regard, *The Biology of Dragonflies* was one of the first entomological books of its kind. Indeed years were to pass before a book appeared devoted to another single insect order. Even today such books are not numerous. In those early days, to monograph a whole insect order was a huge undertaking; and when one bears in mind that most of the contents of Tillyard's book derived from his own researches, his achievement becomes even more impressive.

I first encountered *The Biology of Dragonflies* in August 1949, when I was a recent graduate aged 20. Immediately it became a source of inspiration for me, and a secure launching pad from which to learn as much as I could about the natural history of dragonflies. Few books in my extensive odonatological library have been used as frequently and as reverently as this one. Tillyard's fine book has long been out of print, and second-hand copies are not easily obtained. Richard Rowe has performed a valuable service to odonatologists by placing a scanned version on the web at:
http://www.jcu.edu.au/school/tbiol/zoology/auxillry/odonata.htm (the resource and contents page), which links with
http://www.jcu.edu.au/school/tbiol/zoology/auxillry/odonata/tillyar1.htm

Tillyard was undoubtedly one of the world's most productive and distinguished odonatologists: apart from his 1917 book, he authored at least 70 substantial and scholarly papers on Odonata. Interestingly, although dragonflies were his first and abiding
love, only about one third of his 213 scientific and entomological publications included material about Odonata and, although he published on this order throughout his active life – from 1904 to 1937 – 70% of his publications on Odonata had already appeared by 1917 (Fig. 1). His publications on other aspects of entomology began in earnest when he was aged 36, in 1917, the year when his book on dragonflies was published, and continued until 1937, the 50% level having been reached by 1923. Tillyard remains the only scientist to have been elected to the Royal Society of London primarily for his research on Odonata, a distinction he received in 1925, when he was only 44, a relatively early age for a biologist to be so recognised. By far his most productive years as an odonatologist were between 1915, when he left school teaching at Sydney Grammar School to take up a Linnean McLeay Fellowship (which enabled him to devote the whole of his time to research) and 1920 when he became Chief of the Biology Department of the Cawthron Institute, Nelson, New Zealand. From then until 1934, when he retired as Chief Commonwealth Entomologist for Australia, he remained an administrator, a role unsuited to his talents. It is therefore remarkable that more than 80% of his non-odonatological publications appeared between 1920 and 1934 – the years he spent as an administrator.

Tillyard contributed massively to odonatology in ways too numerous to list here. Primarily of course he put Odonata on the scholastic map through his 1917 book, which presented a masterly synthesis of contemporary knowledge of the order. In addition, however, he investigated several aspects of odonatology in depth. In this brief account I can only touch briefly on these aspects', but to do so reveals the breadth and depth of Tillyard's interests and competence. Here is a short list of the main topics that engaged his attention.

1. Taxonomy.
2. Functional morphology, including ontogeny and phylogeny.
3. Description of larvae.
4. Life cycles and natural history.
5. Evolution.
6. Ontogeny and phylogeny of wing venation.
7. Drought resistance in larvae.

We may examine further his treatment of each of these topics.

1. **Taxonomy.** Tillyard described numerous new species, predominantly from Australia, many of which he had first collected himself. All descriptions were amplified by comments on the species' systematic affinities (e.g. 14) and many contained informative field notes on habitat and behaviour (e.g. 8).
2. **Functional morphology.** Tillyard's study of the caudal appendages of Zygoptera (26, 27) remains the foundation for ecological studies of larval Zygoptera today. He described the several morphological types, their external and internal structure, and their modification as respiratory or adhesive organs. His classification encompassed the range from saccoid (26) to lamellar types (24) and recognised the non-functional type found in the plant-dwelling and terrestrial larvae of the Hawaiian genus *Megalagrion* (24, p. 294). He investigated and described the breaking joint at the base of the appendage, blood corpuscles and circulation, and the tracheal supply (25). His study of the rectal gills of Anisoptera (20, 22) characterized the different types (24, p.181) and the structure (24, p. 182) and ontogeny of each, and proposed a framework for their phylogeny. As an accompaniment to this study, he investigated the first filling of the tracheae with gas in the newly moulted stadium-2 larva and showed by experiment that the gas was carbon dioxide (22, 23).
3. **Description of larvae**. He discovered and described the larva of several Australian species, including that of the extraordinary and supposedly primitive *Hemiphlebia mirabilis*. Characteristically he made a detailed study of its morphology, drawing attention to the supposedly persistent glossae and paraglossae on the median lobe of the larval labium. He also described larvae of other taxa, namely *Austrolestes leda* (9), *Petalura gigantea* (10), spp. of *Diphlebia* (11, 17), *Austropetalia patricia* (12) and *Adversaeschna brevistyla* and *Hemianax papuensis* (21)
4. **Life cycles and natural history**. To read Tillyard's accounts of the natural history of dragonflies is to share his excitement at discovery. An account that continues to give me pleasure is that of the life cycle of *Petalura gigantea,* (10, 16) in which he describes the system of waterlogged tunnels in which the larvae dwell (16). He comments on the species' supposed antiquity, in respect of its structure and semi-aquatic habits. In the first of these accounts he commends the practice of "spending long days in the spring and summer, watching the insects in their natural haunts."(10, p.257). Tillyard was patently no closet naturalist. He also published on the life cycles of other taxa, notably species of *Austrolestes* (9), *Diphlebia* (11, 17) and some aeshnids (21).
5. **Evolution of the order**. Drawing on his unrivalled familiarity with fossil insects, Tillyard proposed a framework for the phylogeny of Odonata (33), later elaborated in posthumous monographs in collaboration with F.C. Fraser (35, 36, 37). In drawing inferences about the evolution of the order, Tillyard was able to call on his own detailed descriptions of odonate fossils, from both the Palaeozoic (30) and the Mesozoic (28).
7. **Drought resistance**. Tillyard's now classic experiments on drought resistance in the larva of *Synthemis eustalacta* (13, 15) remain one of the very few secure sources of information about the all-important phenomenon of drought resistance in odonate larvae. In Australia's arid climate the interpretation of odonate life cycles depends greatly on knowing whether, and for how long, larvae can survive in the absence of free water.
6. **Wing venation**. Wing venation had long formed the basis for classifying Odonata. Tillyard tried to systematise and standardise the terminology for wing venation and of course used wing venation extensively for his interpretation of the affinities of fossil Odonata (19). He also tried to interpret the ontogeny of venation in the larva in the light of ideas on the phylogeny of the order as a whole, tracing the development of the principal veins in the wing sheaths of the last two larval stadia (24, 18, 19, 25, 29).

## Conclusion

My admiration for Tillyard's unrivalled contributions to odonatology is of the highest order. It is enhanced by the knowledge that, for much of his productive life, he experienced great and persistent pain from a back injury deriving from a railway accident sustained in 1914 (4, 5). R.J. Tillyard was truly a great man, and odonatologists today can be proud to be able to build on the legacy that he left to our science.

## Acknowledgements

I have pleasure in thanking Dr John Hawking for the invitation to deliver this appreciation of R.J. Tillyard's contributions to odonatology, Dr Jeremy Evans for having provided me with a complete list of Tillyard's publications, compiled by Mary Alice Evans, and Professor Andreas Martens for having obtained information about scientific journals.

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Figure 1. Cumulative number of publications by R.J.Tillyard on Odonata (A) and other insects (B) in relation to time (lower *x*-axis) and Tillyard's age (upper *x*-axis). The horizontal broken line indicates the 50 percentile for the cumulative curves. Vertical arrows show the times of Tillyard's election to the Royal Society of London (F.R.S.) and the publication of his two books: publication 24 (Book 1) and publication 31 (Book 2).

## WELCOME to NEW MEMBERS

**AUSTRALIA**

Bert Orr 26, Currimundi Road, Caloundra, Queensland 4551

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**COSTA RICA (our first member in this country!)**

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John Neville YATES PO Box 207, Imbil, Queensland 4570, Aust.

## Obituaries

### Ronald Ian Silsby, 1921-2002

Ronnie Silsby, who died on 10 June 2002 aged 81, was not primarily an odonatologist, but one by affiliation. On the contrary, before he became known to odonatologists, largely through his role as support and mentor to his wife, Jill, he had already completed a career: first, on active service, as a major in the Royal Artillery and Parachute Regiment in the Burma campaign during World War 2, and then, having graduated BSc with First Class Honours in Chemistry from the University of London at Southampton in 1949, he served with the Heavy Organic Chemicals Division of ICI in Co. Durham, India and London, followed by 15 years with ChemSystems in Saudi Arabia and London, at one time designing petrochemical plants for the Saudi government. To his many odonatologist friends it will come as no surprise to learn that, among his colleagues in ICI, Ronnie was highly regarded for his competence, fairness and qualities of leadership.

As Jill progressively embarked on projects of her own, involving birds (in Saudi Arabia) and later dragonflies (on a global scale), Ronnie was outstandingly and unfailingly supportive. For example, for much of the time (1987-1994) that Jill was Secretary and Publicity Officer of the British Dragonfly Society, Ronnie served as Treasurer (1989-1996), to the lasting benefit of the Society's financial viability. Ronnie continued his staunch support for Jill during the critical, formative years of WDA, and for this WDA members are much in his debt, as they are also for their encounter with his personality – a memorable blend of dignity, courtesy, helpfulness and charm, which persisted even during the struggle of his last years when he became progressively less aware of his immediate surroundings. Members of WDA who had the privilege of knowing Ronnie will remember him as a perfect gentleman. We acknowledge his contributions to odonatology with affection and respect, and offer sympathy to Jill in her loss of a loving and stalwart companion. *Philip Corbet*, April 2003

### Faith Evans (née Tillyard), 1912-2003

The 3rd WDA International Symposium of Odonatology was dedicated to three distinguished Australian odonatologists: Tony O'Farrell, Robin J. Tillyard and Tony Watson. The occasion was made memorable for members present by the attendance, as honoured guests, of Faith Evans (nicknamed 'Dutchy'), Tillyard's second daughter, and Dr Jeremy Evans, Faith's son and Tillyard's grandson, presently a Visiting Fellow at the Australian National University, Canberra. The Symposium included two invited lectures about Tillyard: from Jeremy, about Tillyard's life and work; and from me, about Tillyard's contributions to odonatology. Faith illuminated the occasion by virtue of her exuberant charm and her lively interest in the proceedings. She was clearly very moved by the meeting's celebration of her father's work.

Members felt privileged to experience this link with one of the greatest and best known of odonatologists, who had been known personally to no one present except Faith herself (he died in 1937). Faith was born in 1912 to Robin and Pattie Tillyard, being the second of their four daughters. Faith married the late John Evans, another distinguished Australian entomologist, who was an international authority on leafhoppers, and who finished his varied and distinguished career as Director of The Australian Museum in Sydney. Faith not only married an entomologist but, after rearing two children, worked in a Zoology department and completed an MSc degree on the systematics of an hemipteran group. She took pride in being the only one of

her siblings to inherit her parents' fascination with insects. Faith was knocked over by a car on a pedestrian crossing not far from her house in Sydney on 18 March 2003, and died in hospital four days later.

She will be greatly missed by those who knew and loved her, especially her many devoted descendants, to whom we offer our sympathy. Jeremy told me that it meant a great deal to all of them to know how thoroughly she had enjoyed the Beechworth meeting. Her sentiments were richly reciprocated by those attending, who considered themselves honoured to make her acquaintance. *Philip Corbet*, April 2003

### David Allen Lewis Davies

By now, many of you will have heard the sad news that Allen Davies died on 2 March 2003, at the age of 79. Allen will be a great loss to the odonatological world and will be missed by his many friends, both amateur and professional. He was a person of immense talent, not just in the study of dragonflies. He seemed to be successful in most things he attempted. He had a highly successful army career in the war and as a young officer he was a tank commander on D-Day and saw action from Juno Beach to the Rhine. He later had a role at the Nuremberg Trials. However, he was a professional research biochemist for most of his working life and an amateur interest in dragonflies provided him with some nice balance to his busy life. As his career was drawing towards its end, he gently allowed the odonatological side of his life to expand until it became a major commitment. When one of us spoke to him and implied that he was lucky to have so much time to carry out his dragonfly work now he was 'retired', he always replied that he had never had so little spare time. Allen believed in the ability of the natural world to enrich the human experience and he retained into adulthood a childlike excitement with insects and especially dragonflies: their colours, shapes, diversity, behaviour and habitats all fascinated him. He believed that much of this would be lost due to human greed, unless steps were taken to conserve what we have. However, he believed that conservation could only be based upon sound taxonomy and faunistic knowledge. He had little time for identification of tropical species by photograph. He was fascinated by odonate evolution, and the puzzles that it presented; the survival to the present day of ancient relics, usually adapted to very specialised habitats ('bizarre niches'), under-utilised by modern and successful taxa, needed explanation. He was prepared to travel to distant regions to rediscover a 'lost' species. As a great collector of dragonflies, he placed great store on the value of a synoptic collection and he made every effort to obtain representatives of as many of the world's genera as possible. By the end of his life, he probably had obtained representatives of about one half of the world's species, mostly collected by himself personally. If he was unable to obtain a species himself he was always very adept at exchanging material with someone who had just returned from a successful expedition. The phone-call on our return was almost a certainty! Many of us have been 'squeezed' by Allen for a phylogenetically interesting specimen ! This has now benefited the Cambridge Univ. Museum of Zoology to whom the Davies Collection has been bequeathed. He had an exceptionally keen eye for habitat and behaviour, and he had a great talent to 'think like a dragonfly' and predict where the different sexes would be at any particular time and weather condition. He was very adept with the net, having the natural ability to 'follow through' with a stroke as an insect flew up and went off at an unpredictable angle. He was an exceptional field worker almost to the end of his life.

He was a great practical joker. Once, when leaving Madagascar, he clambered into a wheelchair at the airport to try, unsuccessfully, for an 'upgrade' to business class. Above all, Allen was a really sociable person and a great raconteur. He spoke with great knowledge and sparkle on such things as dragonfly biogeography to the British Dragonfly Society. He encouraged many younger embryonic odonatologists to stretch their wings overseas, and expand their interests beyond the confines of the county survey. A number of enthusiasts, not just in Britain, but also in China, Australia and New Caledonia owe a lot to Allen's lively and enthusiastic encouragement. On the global level, Allen will be best remembered for his generic and specific lists, and his work in New Caledonia and Australia. He also offered considerable assistance and advice to Jill Silsby when she was preparing her *'Dragonflies of the World'*. *Graham Vick* – June 2003

[This is a shortened version of the full one that will appear in the September number of *Odoatologica – Ed.]*

## Reviews

**Dragonflies –** Steve Brooks. Nat. History Museum, London. ISBN: 0 565 09180 8. Format: paperback: 96pp: 210x235mm. Illustrations: 95 colour photographs. Price £9.95. Available from NHM Publishing, Cromwell Road, London SW7 5BD. (USA – Smithsonian; Australia, New Zealand – CSIRO Dragonflies and damselflies are extraordinarily complex creatures but, in the first section of his book, Steve Brooks gives us the basics of what we need to know about them, in such a manner as to enable the reader to understand what odonatists are talking about when they refer to such diverse subjects as Protodonata, the synthorax, or a holotype.

The next four sections concentrate on the odonate life cycle and take the reader from egg, through larva to imago. In simple language we learn, for example, exactly **how** the internal gills of the dragonfly larva absorb oxygen; **how** it is carried through the body via the tracheal system; and **how** the compound eyes provide the unrivalled vision enjoyed by adult odonates. The unique reproductive structures of both male and female are explained and the reader is taken through mating and oviposition by means of text, diagram and photographs.

The penultimate section deals with dragonfly and damselfly diversity. The section briefly, but interestingly, surveys the distribution, appearance, and behaviour of each of the 29 families within Odonata. Although the author claims to illustrate a typical species in each family, unfortunately this is not the case and six of the 29 are unaccompanied by a photograph.

Finally, the reader is shown the effects, good and bad, that humans have had, and still are having, on today's odonate populations. We learn the importance of conservation: how to preserve existing habitats and how to create new ones. Only those whose knowledge of their subject is deep and extensive can pass on that knowledge in words that are simple and easily

understood. Throughout his book, Steve shows not only evidence of his long years of study and research into odonates but also his appreciation of their beauty and uniqueness. Of particular interest are the six 'feature boxes' dotted here and there throughout the pages which describe, in more depth, a variety of diverse subjects: the 'structure of the compound eye' is one, 'reasons for migrating' another, and 'casualties of modern agriculture' a third. *Jill Silsby* – April 2003

**East African Dragonflies –** Peter & Kate Miller. Nature Kenya, 2003. 263pp. 140x215mm. 47 colour photographs & many diagrams and charts. Copies will be sent on receipt of a cheque for £20 sterling each (or equivalent in Euros or US$), made out to Mrs A.K. Miller and sent to: 68 Blenheim Drive, Oxford, OX2 8DQ, UK. Price for students and libraries is negotiable.

I received a copy of this little gem of a book just hours before my deadline for setting printing in motion and have had no time to do more than skim through it. I am only just going to find space to fit in as very brief recommendation. It is designed for use in the field (& laboratory) and assumes no previous knowledge of dragonflies. Stages in the life cycle are described in fine detail and in the simple language that will be remembered with real appreciation by Peter's students and all his friends in the dragonfly world. Basically the book is divided into three parts: the first seven chapters deal with odonates in general, Chapter 8 describes and illustrates 30 representative species found in East Africa, and the remainder is concerned with conservation and recording, and contains glossary, study methods, references and appendices. In addition to colour photographs (taken by Kate) of the 30 species (out of approximately 320 recorded from East Africa) there are excellent diagrams, a species list, an extremely useful identification key, a comprehensive glossary and many suggestions for research projects.

A book like this has been needed for a very long time and I have no hesitation in recommending it to every odonatist living in or visiting East Africa – and western and southern Africa if it comes to that because many of the species classified are also found in other parts of the continent. *Jill Silsby* - June 2003

**A fieldguide to the Dragonflies of South Africa –** Warwick & Michele Tarboton, 2002. 97pp. ISBN 0-620-29887-1.

This colourful little field guide (a private publication) treats all 90 species of Anisoptera found the Republic of S. Africa. Following a brief introduction to classification, behaviour and identification methods, the larger part of the book is devoted to spp. identification. Brief texts on occurrence and identification are accompanied by distribution maps and 34 colour plates. The latter are composed of scans of specimens, the majority of which is of very fresh individuals, showing the life colours. The layout of the plates is attractive and roomy, with an average 7 scans on each plate. Distinctive features are indicated, sometimes elucidated with simple line-drawings and the scans are sufficiently clear for the user to compare and find additional characters himself. On average there are about 3 scans per species, e.g. a dorsal aspect of both sexes and a lateral aspect of one, allowing an impression of the variability. The text is augmented by 29 photos of free-living dragonflies, including some of the most stunning pictures of African spp. ever published (e.g. *Anax tristis* female in flight and ovipositing). With the wealth of illustrations, identification becomes surprisingly straightforward and the user is helped further by simple pictorial keys to families and gomphid and libellulid genera. The accessible image-oriented concept of the book is highly innovative in a group where we are used either to complicated technical keys or photguides using field photos. The example is definitely one to be followed, especially in the species-rich faunas of the tropics where the scans-approach is perhaps the only way to do justice both to the diversity of Odonata and the growing interest in them. It is hoped the authors are planning a similar book for Zygoptera! The book can be ordered for Rand 200, which includes postage (approx 23 Euro/US$) from: Russel Friedman Books cc, PO Box 73, Halfway House 1685, South Africa (attention Shelley.)

**Tel** 0027 11 702-2300**. E-mail**: shelleyrh@mighty.co.za **Website**: www.rfbooks.co.za *KD Dijkstra* – March 2003

# Changes to our Constitution and Bylaws

**1. A PROPOSAL TO CHANGE THE WDA CONSTITUTION TO INCLUDE THE IMMEDIATE PAST-PRESIDENT AMONG THE OFFICERS OF THE BOARD OF TRUSTEE** *Mike May*

**Explanation**

A common practice among scientific and professional organizations is to retain as a member of its governing body the president (or corresponding executive officer) whose term has just ended. This more readily provides the incoming president with the benefit of the experience and advice of the past president, particularly with respect to ongoing or unfinished business as well as tasks or problems that may commonly arise but might not be easily anticipated by someone who has not served in the position. Thus I hope, for my own benefit and that of future WDA Presidents, that the amendments proposed will provide this help and continuity. I should point out that the proposal was approved in principle and without dissent both by the Board of Trustees and the Biennial General Meeting during the recent Symposium in Beechworth, Australia, but to become effective it needs approval by the WDA membership at large. Note also that, for the interim, Philip Corbet, who is now our immediate Past President, was co-opted as a member of the Board of Trustees pending a final decision on my proposal.

In suggesting changes in wording of the relevant paragraphs, I have changed references to the number of Board members so as to allow for the addition of the Past President without increasing the maximum number of members making up the Board (i.e., because the section G.1. of the Constitution allows for a Board of seven to twelve members, I have worded subsequent sections to preserve those limits); my thought in doing so was to avoid setting a precedent of expanding the maximum size of the Board, a practice that could lead its becoming unwieldy. Changed words are underlined.

## PROPOSED CHANGES TO WDA CONSTITUTION

**F. HONORARY OFFICERS.** Via a secret postal ballot the members shall elect from among themselves a president-elect, a secretary/ treasurer (or a secretary and a treasurer), who shall hold office from the conclusion of the next biennial meeting. The previously elected president-elect shall wherever possible take over as president but in the event of the president-elect being unable to take up the office of president, then there shall be a postal ballot to elect a president. The outgoing president shall wherever possible serve as immediate past president until the next subsequent biennial meeting but in the event of the president being unable to assume the office of immediate past president the latter office shall be vacant.

**G. BOARD OF TRUSTEES**

1**)** The Board shall consist of not less than seven members nor more than twelve members being:

(a) the four/five honorary officers specified in the previous clause.

(b**)** not less than three and not more than seven members elected via a secret postal ballot at least four weeks prior to the following biennial meeting who shall hold office from the conclusion of that meeting.

## PROPOSED CHANGES TO WDA BY-LAWS

**3. BOARD of TRUSTEES**

**a) (i)** According to Clauses F and G of the Constitution, the Association shall be administered by a Board of Trustees. The Board shall consist of a Chairman (the President of WDA), a Vice Chairman (President-elect of WDA), a Secretary/Treasurer (or Secretary & Treasurer), a Managing Editor of the WDA Journal, and the Immediate Past President plus at least two and not more than six ordinary members

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**b**) Elections to the Board **(i)** All Trustees, except for the President-elect and President, shall resign at the BGM following the one at which they took office but, apart from the President, they shall be eligible for re-election. The President-elect shall automatically take over as President. In the event of this being impossible, the President shall be replaced by the newly elected President-elect who shall then serve an extra term and the Board may appoint a President-elect to take his place or, alternatively, leave the post unfilled until nominations are next called for. The outgoing President shall serve as Immediate Past President until the BGM following the end of his/her term as President.

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**2. SAFEGUARDING THE REPUTATION OF WDA** *Philip S. Corbet and Michael J. Parr*

**Explanation**

The effectiveness of an association, especially a charitable trust, in achieving its objectives depends on the respect it commands, and this in turn depends on the conduct of its members. If a member, by his or her conduct, brings the trust into disrepute, the Trustees have a responsibility, both to the trust and its membership, to make explicit their disapproval of the offending action and to dissociate the trust from that action. A conspicuous and effective way of achieving this may be to terminate the membership of the trust of the member responsible for the offence. To some extent provision already exists in the Constitution for achieving this (i.e. in clause E.5) but, having regard to the discussion at the Second Biennial General Meeting at Gällivare on 24 July 2001, we are of the opinion that the existing clause can be improved, partly in order to make any proceedings more open and better understood. The outcome of our deliberations is the following proposal. We thank David Fitch for his valued advice and help with formulation of the proposal. In conformity with Clause T of the WDA Constitution, this proposal is now subjected to a postal ballot by the membership. (Due to the mistaken belief by P.S.C. and M.J.P (combined ages $12^2$ years) that this article had already been launched, this proposal is appearing later than the authors would have intended.)

**The proposal:**

That clause E.5 of the WDA Constitution be replaced by the following passage:

"5) In exceptional circumstances, including those in which the Board deems that a member's conduct has brought disrepute upon or is inconsistent with the objects of the Charity (the WDA), the Board may, for good reason and by unanimous vote, refuse or terminate the membership of any individual or member organisation. The Board shall report its decision, and the reasons for it, to the membership at large through the newsletter. A terminated member may request reinstatement by written request submitted to the Board, which shall act on same according to such procedure and standards as it in its sole discretion deems appropriate."

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**The WDA is about to celebrate its sixth birthday. It has its roots in Slovenia but its branches spread all over the world. Our membership is now 253 and we have members in 35 countries**