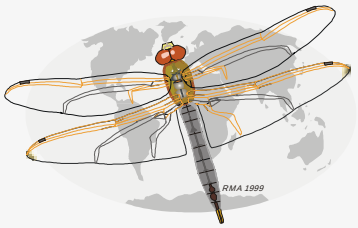

W.D.A's AGRION

THE NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

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EDITORIAL

So W.D.A. starts its fourth year as an international association and this issue of AGRION is the seventh to be published. The January 1999 AFRICA issue proved very popular and, with less arm twisting than is usually needed, the number of contributors was gratifying. I would like to try another special issue. Of course we could concentrate on other regions of the world: Asia, Australasia, the Americas and Europe are strong contenders and each will make an excellent issue in the not too distant future. But this time round, I'd like to devote the January 2001 issue to **Our beautiful Odonates.**

Although it is extremely difficult to pick a favourite from among so many beautiful examples, I would VERY much like as many of you as possible to try! For example, one of my undoubted favourites is *Euphaea refulgens* and I would write about where I was when I saw it, why I was where I was, what it looked like of course but also how it behaved together with a good word-picture of its habitat. I envisage a collection of "little gems" from all parts of the world so, with this in mind, if you find it difficult to chose, then it would be best to select a species (or even a small genus) that is very unusual or one that inhabits a 'difficult-to-get-at' part of the world. Calopterygids and euphaeids certainly stand out but other families have spectacular species too and let's not forget the anisopterans!

I would really appreciate your support in making the issue an outstanding one so **please** let me have your contributions: deadline is October 30th but the sooner the better! Meanwhile, look at Reminder 3 on the final page of this issue!

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IN MEMORIUM - Dr ELLIOT PINHEY

Like many others will have done, I felt a real sense of personal loss when I heard that Dr Pinhey had died on 7 May 1999. To odonatists, lepidopterists and almost all other entomologists who have spent time on the continent of Africa, his name was one to revere, and I would like to repeat what I wrote in the AFRICA issue of AGRION in January 1999: "It can hardly have escaped anyone's attention that, in almost every one of the above accounts, the name of E.C.G. Pinhey is mentioned. He is thought of with affection, respect and gratitude by countless odonatists who have visited Africa."

I first met Dr Pinhey during the 1985 International Odonatological Symposium in Paris. Those of us who attended that meeting cannot fail to remember the talk he gave; it was a very long talk and, try as he would, the chairman found it impossible to stop the flow: no-one in the auditorium wanted it to stop anyway! His love of Africa's flora and fauna was very evident as was his undoubted affection for his African companions. I was new to the world of dragonflies whilst Elliot had only recently retired from Zimbabwe but his kindness and enthusiasm when he heard that Ronnie and I were often in Africa and were interested in its odonates was boundless and we spent much of that week in each other's company, continuing and strengthening the friendship after we returned to England.

Elliot's retirement was not as happy as it should have been and he deserved a far, far better one. He seldom grumbled (and he had much to grumble about) but he was undoubtedly hurt by the treatment meted out to him by the Museum in Bulawayo (later Harare) that he had served so well for so long. He will be remembered for many years to come and his many publications on African odonates will be the base from which today's researchers and authors will work. (I am grateful to Martin Schorr for producing the bibliography that follows.)

Elliot and his wife, Nancy, made a lovely couple and our sympathies go out to the latter in her bereavement. ***J.S.***

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Odonatological Bibliography prepared by Martin Schorr

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NEWS from MEMBERS

Peter Allen (UK) and his wife Cindy had a trip to **Cuba** in April; having done their homework before they left they knew what they might expect to see - and they were not disappointed. *

Anthony Brownett (UK) is interested in field studies of the British and Irish dragonflies - and in world dragonflies as illustrative of biological themes and variations. His long-term vision is to see a handbook of the British & Irish dragonflies with a species-by-species synthesis of current knowledge.

Philip Corbet (UK) is particularly interested in seasonal regulation and is busy writing up arrears of research work on various topics. He is an active member of the Cornwall Wildlife Trust: serving on its Council, Executive and as Chair of Conservation Strategy Committee. *****

Nick Donnithorne (UK) is a dedicated amateur odonatist and, since attending an exuviae ID course at Britain's National Dragonfly Museum, his interest in exuviae is waxing strong. He is dragonfly recorder for South East England and has been carrying out specific exuviae surveys on two small ponds near his home in Sussex, with particular emphasis on *Cordulia aenea, Somatochlora metallica* and *Aeshna cyanea*.

Graham Giles (UK) continues updating his list of **Cyprus** Odonata, with local help. Several 'new' species have been recorded since 1960 when the latest list was published. In December 1999 he visited **Sri Lanka** on a guided tour, seeing only about ten species; Graham wrote that there was no published literature since the 1920s *(BUT see p. 25, Ed.)*

Dave Goddard (UK) kindly sent me details of walks he will be leading this year on behalf of the Bennerley Marsh Wildlife Group, mainly with the idea of providing material for inclusion in our Annual Report to the Charities Commission, but I think many of you will be interested in his odonatological activities. Between May 14th and Aug. 6th, Dave will lead eight dragonfly walks; over these weeks, species with a variety of flight periods will be on the wing.

Matti Hämäläinen (Finland) spent time in **Thailand** in October last year. It was a nice trip with some good results. One new aeshnid for Thailand was found in Kanchanaburi: *Polycanthagyna ornithocephaia*.

Katsuhisa Hayashi (Japan) is a high school teacher and studying molecular phylogeny of dragonflies in the graduate school of Niigata University.

Sarmite Inberga (Latvia) is a student at the Faculty of Biology, University of Latvia. She is interested in the faunistics and ecology of dragonflies and is working on her Master's thesis.

Jens Kipping (Germany) is a student studying Nature Conservation and will be taking part in a project to survey emergence patterns of invertebrate groups in **Botswana**'s Moremi Game Reserve in the Okavango Swamp. WDA made a small contribution towards his expenses from the Conservation Fund and we look forward to his report when he returns.

Bill Mauffray (USA) * and **Ken Tennessen (USA)** spent 3 weeks in **Bolivia** during the end of last year. "It was great!" wrote Bill.

Peter Mill (UK) is to be congratulated on being elected a Fellow of the Institute of Biology. *****

Norman Moore (UK) continues his research on the behaviour and ecology of dragonflies on his pond at Swavesey in Cambridgeshire and also on that of *Aeshna isosceles* in East Anglia.

Mike Parr (UK)'s interests cover all things odonatological, especially ecology, behaviour and taxonomy of **African & Madagascan** species. He and Marion had a visit to **Kenya** this April which, while not being primarily orientated towards dragonflies, included a visit to Mt Kenya National Park where, in the cold streams at near 10,000ft (3,150m), Mike found *Pseuagrion bicoerulans* and a presumed, but as yet unidentified. *Enallagma* species. *

Dennis Paulson (USA) and his wife Netta Smith enjoyed a week in **Florida** in January this year. It was clearly an exciting odonate experience, with a total of 41 species observed (extraordinary for the time of year), including two new species for the United States. The publication of a promised note is eagerly awaited. *****

Evelyn Prendergast (UK) does sterling work for dragonfly conservation on Ministry of Defence (MoD) lands in Dorset. His other big interest is The Gambia and he gives as much assistance as he can to the Department of Parks and Wildlife Management in their endeavours to create a River **Gambia** National Park. Evelyn and Mary enjoyed a visit to the **Algonquin** National Park in September '99. They saw few odonates but they did see moose - and were visited by raccoons! Evelyn, [***like me! Ed***] is full of praise for Matt Holder's little book on the Park's odonates which was published in 1996.

Michael Samways (S. Africa) tells me the 'dragonfly trail' project in the **Pietermaritzburg** Botanical Gardens is now finished and that the practical side will be up and running soon. Michael is at present on sabbatical, working all out on his South Africa book. At present distribution data is being collected so that maps can be produced.
Wolfgang Schneider (Germany) was appointed Deputy Director of his Museum (HLMD) in April. Congratulations Wolfgang!*
Jan Taylor (Australia) did not have a happy start to the new millennium but we send best wishes to his wife Madeleine for a speedy recovery. Not surprisingly, Jan has had little time for *Petalura hesperia*-observing this year but a few notes from him may be found on p.25
Hidenori Ubukata (Japan) spent October and November, 1999 in **Cairo** but had little time for odonatology - he was there for science education. However he did give his net (last used at Colgate) to an Egyptian colleague and, as a result, hopes to receive information and specimens from the Delta area. In January Hidenori-san published the 6th Number of the Japanese WDA Newsletter, "Dayori". Congratulations to him!! * * = Attended Colgate Symposium

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NEWS from the UNIVERSITIES

University of Leeds. **Peter Mill** reports that, in conjunction with research student Louise Schofield, he is working on the population dynamics and dispersal abilities of *Calopteryx splendens*, with particular reference to the limits of its range.
East Tennessee State University. Dan Johnson wrote:
1) The Hine's Emerald Dragonfly (*Somatochlora hineana*) Recovery Team met in November 1999 to review numerous thoughtful comments about the Draft Recovery Plan that had been distributed in July 1999. A revised Plan that incorporates many of those suggestions and responds to many others was completed in early January 2000. It will soon be submitted to the Regional Office of the U.S. Fish and Wildlife Service for final approval and implementation. On behalf of the Recovery Team, I thank the many odonatological colleagues who offered their comments for our consideration.
2) My student, **Bryan Reece**, is completing a M.Sc. thesis on early survivorship of *Epitheca (Tetragoneuria) cynosura* larvae. He's also applying to Ph.D. programmes where he might pursue his interest in dragonfly ecology and conservation.

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CONSERVATION NEWS

Norman Moore*: "Aeshna isosceles* is the only British dragonfly which is nationally Endangered using IUCN's global criteria. The reason is that all its known breeding sites in Britain lie within one metre of sea level, and hence all are threatened by rising sea levels due to global warning. At present *A. isosceles* is well conserved in several nature reserves but all of them are susceptible to rises in sea level. Therefore there is an urgent need to create new habitats for the species which are out of reach of salt water incursion, both on land adjoining existing sites and in the Fens, where *A. isosceles* has been extinct for many years. This work has to be supported by research on the requirements of *A. isosceles* and on the Water Soldier (*Stratiotes aloides*), the plant on which the dragonfly appears to depend in England.
Mike Parr: "I feel increasingly that 'conservation' has lost its way. We need to have a fundamental reappraisal of where it is going, why and when. So much conservation is in the short term - 'quick fixes', without consideration of long term and ultra-long term (i.e. in geological time) implications."
Evelyn Prendergast has bad news regarding the future of the important *Coenagrion mercuriale* colony on the MoD ranges at Lulworth in Dorset. The species is at risk following changes in the arrangements for the discharge of water from the claypit.

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BENNERLEY MARSH WILDLIFE GROUP - David Goddard

Well now, I hear you ask where, what and who are the Bennerley Marsh Wildlife Group, to answer this I must give a bit of the history behind the group.

It all started with a few people bird watching in an area beside the River Erewash, just outside Ilkeston on the border between Nottinghamshire and Derbyshire, it being a good site for wintering Golden Plover and Lapwing. We gradually got to know each other whilst bird watching and found we all wished to 'protect' this valuable area of flood plain - thus the group was formed in 1995. We now have around 100 members and are going from strength to strength in our efforts to conserve the wildlife of the river valley. We produce an annual report detailing the sightings within our chosen recording area.

The group currently records birds, butterflies & moths, dragonflies, plants. mammals, reptiles and amphibians and it is with these records that we are able to present, in detail, the diversity and need for conservation of the wildlife in the river valley to other wildlife organisations, councils etc.

In the last three years a new bypass has been built which runs along the edge of our recording area. This has had an effect on the wildlife but not all to its detriment. As part of the bypass plan it was agreed a wildlife area would be created between the bypass and the Nottingham canal. This wildlife area is to be known as the Willoughby Top Cut after a famous local naturalist Sir Frances Willoughby and has been designed to have as diverse a range of habitats as possible, the three pools and the shallow ditches are of the most interest to dragonflies. To date the area has produced the following list:

Banded Demoiselle *(Calopteryx splendens)*
Emerald Damselfly *(Lestes sponsa)*
Red-eyed Damselfly *(Erythromma najas)*
Large Red Damselfly *(Pyrrhosoma nymphula)*
Southern Hawker *(Aeshna cyanea)*
Brown Hawker *(Aeshna grandis)*
Migrant Hawker *(Aeshna mixta)*
Emperor Dragonfly *(Anax imperator)*

Blue-tailed Damselfly *(Ischnura elegans)*
Common Blue Damselfly *(Enallagma cyathigerum)*
Azure Damselfly *(Coenagrion puella)*

Black-tailed Skimmer *(Orthetrum cancellatum)*
Broad-bodied Chaser *(Libellula depressa)*
Four-spotted Chaser *(Libellula quadrimaculata)*
Ruddy Darter *(Sympetrum sanguineum)*
Common Darter *(Sympetrum striolatum)*

There is one other species that has been recorded a few times within our recording area: the Common Hawker *(Aeshna juncea)* - we hope that it will become established.

This number of species recorded in the area results from its closeness both to the River Erewash and to the Nottingham Canal from which many of the dragonfly species have colonised the pools. The group has been involved from the outset in the management and recording of the area for the local council. It was our members along with other volunteers who helped plant many of the 2000 wildflowers and plants and will be carrying out some of the habitat management for this site over the coming years. So as you can see we are making ourselves useful by helping to protect and enhance the environment for wildlife. The group is hoping that a recent application for local nature reserve status will be successful as this will further help to protect it for the future.

There are several areas (ponds, rivers and canals) within our recording area which are important to dragonflies. Most of these are open to the public but there is one important area, consisting of three de-acidification pits which are on private land and therefore have restricted access. It is this area which has shown some of the greatest promise in the last two years with several species having been recorded as ovipositing and emerging.

One of the aims of the group is to protect and enhance the whole area for wildlife, to help achieve this aim the group thinks it important to get the local people involved. We hope to achieve this by conducting guided walks through out the year during which we aim to 'educate' them and show the beauty and diversity of the wildlife to be found within our recording area. The summer walks are primarily devoted to dragonflies and butterflies. Where possible I try to catch a damselfly or dragonfly and place the insect in a container for those on the walk to see the insect close up and this certainly has brought some very interested responses (I always let the insect go of course).

The challenges for the group and the wildlife in our area are many and varied. As we record and document the area we are able to present solid facts and figures to back up our position that it needs to be conserved. I would encourage everyone to make an effort to fully record all their dragonfly sightings and then to pass then on to the correct person be that either a county or regional recorder or to a body such as the British Dragonfly Society. In this way a complete and accurate picture can be obtained and the data can be used to help conservation.

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USE of ODONATE LARVAE for BIOCONTROL of INSECT PESTS - Philip Corbet

The contribution entitled "Tips" that appeared on page 11 of *WDA's Agrion* 4(1) implied that releasing adult dragonflies in nature could suppress biting flies, such as mosquitoes, as effectively as applying insecticide. For several reasons it is important that such a claim should not be allowed to pass without comment. First, there is almost certainly no secure evidence to support it; second, there are compelling theoretical arguments for supposing it to be unfounded; and third, because using dragonflies in this way is inappropriate, the resulting failure being likely to discredit the practice of biocontrol. I shall try to explain what I mean.

There are two approaches to biocontrol of pests: inoculation & inundation. *Inoculation*, sometimes called 'classical biocontrol', entails introducing natural enemies (parasites, parasitoids, pathogens or predators) of a pest into an environment where they are not already present. This approach, after the requisite precautions have been observed, can be feasible in situations where a pest has been introduced into a new country without its complement of natural enemies. If the inoculation is successful, the natural enemies multiply naturally until they reach a level such that they either eliminate the pest or keep the pest populations down to a level deemed acceptable to humans. Inoculation rarely succeeds, partly because damage thresholds recognised by humans are usually far lower than natural enemies can achieve (after all, an oligophagous predator needs to leave some prey to feed on), and partly because, if natural enemies attain high densities, either at the time of release or subsequently, they typically disperse, thus reducing their effectiveness for local suppression. The other approach to biocontrol is called *inundation* or *augmentative release* (AR). This entails prior estimation of the numbers of natural enemies needed (within a given area and a given time) to achieve suppression to the required level, and then releasing sufficient numbers into a closed system, i.e. an environment from which they cannot disperse. If the requisite conditions are satisfied, AR can be highly successful. Indeed it is used routinely in several countries for the suppression of pests in greenhouses – closed environments from which neither natural enemies nor pests can disperse.

The only example known to me of dragonflies having been used successfully for suppressing a pest insect was a case of AR. It entailed releasing known numbers of half-grown larvae of the libellulid *Crocothemis servilia* into domestic water-storage containers in Yangon (Rangoon) in Myanmar (Burma). The water-storage containers were being used by the aquatic stages of the Yellow Fever Mosquito *Aedes aegypti*, which was responsible for the transmission of Dengue Fever in that locality. More than 92% of the local population of *A. aegypti* was occupying the containers which, because of their function, were easily accessible to householders and control operators. The systematic release of dragonfly larvae during the monsoon season (the time when Dengue Fever was being transmitted by the mosquito) rapidly depressed the mosquito populations to a level lower than could have been achieved by any other known method, including treatment by chemical insecticide. The trials that demonstrated the effectiveness of this approach have been described by Sebastian et al. (1990). That account has been followed by several shorter papers devoted to explaining the distinction between the two different approaches to biocontrol, and enumerating the reasons why the Yangon trial was successful. I repeat these reasons here because they illustrate the requirements if a programme of AR using dragonflies is going to offer prospects of success.

The conditions that allowed the Yangon trial to be successful were:

- the confinement of a very high proportion of the aquatic stages of the target species to containers accessible to control operators and householders;
- the availability, when needed, of a predator able to exert control promptly;
- a methodology for propagating the predator reliably and in sufficient numbers;
- a means of distributing the predator among containers harbouring aquatic stages of the target species;
- the desire by the local community to achieve suppression of the target species and to do so without using chemical insecticides in their domestic water supply; and
- understanding and acceptance by the local community of the rationale of AR of predators in domestic water-storage containers and willingness to participate in practical aspects of the control programme.

These conditions, clearly validated in the Yangon trial, illustrate the essential distinction between inoculation and AR, and they show why careful research and planning need to underpin any serious attempt to use dragonflies for biocontrol. After the account of this work was published, it became evident that the distinction between the two approaches to bio-control was not always being understood and this prompted me to publish several short articles (e.g. *Kimminsia* 1: 12 and 2: 13-14; *Selysia* 20: 3, 7) in which I tried to explain the distinction and thus emphasise the conditions that must obtain if dragonflies are to be used in biocontrol attempts. I have also analysed the Yangon trial in my recent book (1999: 119-121), listing the attributes that a dragonfly must possess if it is to serve successfully as a biocontrol agent, and suggesting environments in which biocontrol attempts might offer promise.

From time to time it has been suggested that collecting dragonfly larvae from one place and translocating them for rearing and release in another place, can effect pest suppression at their destination. From what I have said it will be clear that the chances of such an approach being effective are vanishingly small. Furthermore, such actions are, by a sharp irony, likely to be counterproductive, because translocating dragonfly larvae from one habitat (in which they have managed to survive the disproportionately high mortality associated with earlier instars) to another where conditions may be less suitable is likely to increase their mortality and thus reduce the overall effectiveness of the resulting adults in suppressing pest insects. Also, to move living organisms from one habitat to another should always be discouraged unless the translocation is part of a project approved by an authority with appropriate expertise and containing provision for rigorous pre- and post-release monitoring. Not only can the introduction of predators like dragonfly larvae disrupt the balance of the ecosystem that receives them, but such an operation can seriously undermine the work of biological recorders whose findings provide data essential for studies of distribution and biodiversity. To summarise:

- Biocontrol, as a benign alternative to chemical control, should always be the preferred method of pest suppression.
- Biocontrol should be attempted only if an appropriate method has been chosen and offers a sound prospect of being successful.
- Augmentative release is the only biocontrol method in which release of dragonflies, as adults or larvae, carries any reasonable prospect of success, and this by its nature must be applied in a closed environment.
- Living dragonflies should never be moved from one habitat to another except as part of an approved, and monitored, scientific project.

Literature cited:

Corbet, P.S. (1999). Dragonflies. Behaviour and ecology of Odonata. Harley Books, Colchester.

Sebastian, A., Sein, M.M., Thu, M.M. & Corbet, P.S. (1990). Suppression of *Aedes aegypti* (L.) (Diptera: Culicidae) using augmentative release of dragonfly larvae (Odonata: Libellulidae) with community participation in Yangon, Myanmar. Bulletin of Entomological Research 89: 223-232.

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The "SAD EMPEROR" and the SAILORS - Wolfgang Schneider

Reading Jill Silsby's account of her efforts to see and observe *Anax tristis* reminded me of my first and only encounter with that species. As the reader will see, the circumstances were exceptional and so was the method I had to use to catch and retain a specimen!

Between April and June 1989 I spent several weeks on board of the Norwegian research vessel "RV Fridtjof Nansen" off West Africa. During this cruise from Gabon to Namibia the Norwegian scientists attempted to assess the stocks of commercially important fish species which were in decline. Being a taxonomist and working at that time as Fishery Resources Officer for FAO (Food and Agriculture Organisation of the UN), my task was to identify the marine organisms in the catches. Because we were trawling day and night (with watches of four hours), it was necessary for me to share the routine of the crew. It was tough - and tough also were the sailors, the guys who caught the fish and manned the vessel.

In the evening of 30 April we were trawling 60 km off the Angolan coast. The trawl was pulled on deck and we were soon up to our knees in slimy fish of all sort. I was identifying and measuring fish on a table when, at exactly 21:05 hours, my attention was caught by the flight noise of a giant dragonfly that was clearly attracted by the light of a lamp immediately above my head. I felt handicapped and inadequate without my insect net, but who is prepared for such a nocturnal encounter 60 km offshore? Only one course of action was available to me and, believe it or not, a single, frantic sweep of my hand was successful – I had captured a male *Anax tristis*! As other dragons (*Tholymis tillarga*) were by then flying round the lamp, in order to have both hands free, I held my captive with its wings between my lips - and those tough sailors, although standing knee-deep in slimy wriggling fish, almost got the heaves just seeing me doing so!

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TACHOPTERYX THOREYI - Jill Silsby

Back in 1989 Ronnie and I attended the Symposium organised by Dan Johnson in Johnson City, Tennessee. During the mid-symposium tour we enjoyed a splendid day in the Bay Mountain Park, where one of the attractions dangled in front of us was the possibility of seeing *Tachopteryx thoreyi* although the chances of doing so were slim as Dan himself had never seen the beast. However, we did see it - under somewhat bizarre circumstances. The park was an ideal place for odonates and, as this was my first visit to the States since becoming interested in them, I was in seventh heaven. At one point I glanced up and found Dan standing some 15 feet away from me - and there was a large insect resting on his jeans: "Don't move, Dan" I shouted, "you've got a petalurid on your jeans!!" My camera was in my hand and I swiftly took a shot but Dan (who as I've said had never seen a live *Tachopteryx* in his life) just couldn't refrain from trying to take a look, disturbing the beastie as he did so. We saw no more, so it is that picture that will be appearing in my shortly to be published "Dragonflies of the World"!! Most of you will, I hope, have read my account (Vol.3.2) of the trip many of us enjoyed while attending the Colgate Symposium last year and the paragraph dealing with the *Tachopteryx* hunt galvanized Dan into writing the following:

" You might be interested to know that I have only seen *Tachopteryx* three times in my life: first when that beast landed on my jeans and was immortalised by your camera, Jill; second on a fence in Cades Cove in Great Smoky Mountains National Park (I got a photo of that one); and third during the frustrating hike at Enfield Glen last July. While it's true that the group led by Sid Dunkle didn't see the beast, Mattias Hartung caught one for the small group John Hawking & I were walking with. I look forward to seeing that first one in print -- it was so special to have such a creature arrive to entertain my guests! "

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BACK TO BOLIVIA - Ken Tennessen

On our first trip to Bolivia in November 1998 (see ARGIA vol. 10, no. 4, Dec. 15, 1998), Bill Mauffray and I saw enough intriguing Odonata to want to return. This time we were accompanied by Steve Valley and Paul Miliotis, arriving in Santa Cruz on 7 Nov 1999, for a 3-week stay. We rented two Toyota Land Cruisers, as we had to pick up two students, Ingrid Vaca Gonzalez and Malisa Coca Bruno, at El Museo de Historia Natural “Noel Kempff Mercado”, at the Universidad Autonoma “Gabriel Rene Moreno” in Santa Cruz. They are interested in learning about collecting and preservation techniques, and as much as possible about surveying for Odonata, including field identification and habitat requirements. We concentrated our field work in two areas, first around San Ignacio de Velasco northeast of Santa Cruz, and secondly the area around Villa Tunari, not far from Cochabamba.

The first week, as we drove through the countryside north of Santa Cruz, to San Ramon and eventually to San Ignacio, we could see the effects of the drought which has gripped this area for nearly a year. Bill and I had spent a couple of days collecting in this area last year, but now most of the streams were dry or nearly dry. We were not bitten by a single mosquito, compared to last year when Bill and I were driven from a couple sites by bloodthirsty hordes. It appears there has also been an increase in cattle production in this area, as many of the streams appeared more disturbed and enriched. To make collecting more challenging, a cold front swept through this area on our second day and, by the severity, I would guess this air came directly from Antarctica! The temperature was about 5°C, and the wind and rain made it feel much colder. There we were, at 16° south latitude, and we were freezing. Two days later it was 40°C, so hot neither Odonata nor odonatologists were out and about. However, despite the climatic shifts, trouble with vehicles and our health this first week, we did encounter a number of interesting odonates, including a small *Acanthagrion* near *minutum*, several *Telebasis* and *Lestes*, a beautiful red *Coryphaeschna* that appears to be *perrensi,* and a number of *Micrathyria, Erythrodiplax* and other libellulids we have yet to identify. We saw numerous wetlands in the area between Concepcion and San Ignacio that merit further exploration.

We spent most of the rest of our time in the foothills of the Andes, in the area around Villa Tunari (Cochabamba Department). This region is more humid and varied in topography than Santa Cruz Department, and therefore has quite a different fauna. We were pleased to find Polythoridae, Platystictidae (first discovery of this family in Bolivia), and several genera of Coenagrionidae, Megapodagrionidae and Protoneuridae that we had not seen last year. In particular, *Polythore boliviana* is a very large and striking damselfly that in flight resembles a black and orange butterfly, an Ithomiidae that flies concomitantly over the small mountainous streams of this area. It has been suggested that certain *Polythore* species mimic distasteful butterflies and I would like to study the possible relationship of these species further. Another polythorid that stunned us was *Cora terminalis*. Not having seen this species before, I did not even recognise at the time that it was a *Cora*. Instead of the light blue thorax typical of this genus, it’s thorax is dull green with dark brown stripes. Moreover, when males fly, their wings give off a brilliant, iridescent blue flash. Steve and I got a few photographs of a perched male before heavy clouds obscured the light on the only afternoon we encountered them; when the wings are held together they do not show the colour that is so brilliant in flight. Photographing stream damselflies in the tropics is a challenging endeavour, as most tend to perch in deep shade or above eye level. And the most interesting species are quite rare, occupying habitats that are usually cloudy and difficult to find and maneouvre in.

There are 14 families of Odonata now known to occur in Bolivia. The most speciose group one encounters in South America is the Libellulidae. These dragonflies occupy nearly every type of conceivable aquatic habitat in the neotropics and some groups have radiated into interesting specialists. We collected at least 30 genera in this family, and are still struggling to identify some of them. Our preliminary data indicate that, of the approximately 280 odonate species we have recorded for Bolivia so far, about 120 (>40 %) are libellulids. The second largest group is the Coenagrionidae (about 20% of the total species). Quite a few genera and species we collected are not yet published records for Bolivia and we have traversed very little of the country. Certainly much remains to be discovered, and we hope to be able to return to this fascinating country soon.

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SRI LANKA at CHRISTMAS - Peter Allen

In December 1997 Cindy and I decided to give Christmas a miss and tried to find somewhere on the planet where Christmas is not celebrated. There seems to be no such place - if there's a buck in it . . . . We selected Sri Lanka as we figured that a largely Buddhist nation would, at least, not go overboard. We arrived to find temperatures and humidity in the 90s - and plastic snowmen, Father Christmases, snowflakes. All very tasteful. We also selected Sri Lanka as an introduction to eastern odonate fauna, which was new to us. Terence de Fonseka was in the process of publishing a book on the 117 spp. so far recorded and he was kind enough to send us a pre-publication copy which was to prove an immense help.

Overnight flights from UK arrive in Colombo at around 5.30am and one's first thought is of sleep. But, looking out of our window at the nearby Airport Hotel, we spied a rough, boggy area in the grounds between the tennis courts and the carport. A quick look through binoculars at first light revealed some fluttering wings which I couldn't wait to go and investigate, but my sensible other half insisted that we needed a few hours sleep to recover from the flight. I thought "As soon as she's asleep I'll just creep down . . . . "

When I awoke at around 12.30 the area was in full sun and alive with odonates. Investigation showed *Ischnura senegalensis* and *I. aurora* in the grassy margins of a seepage, while a nearby boggy area was full of *Neurothemis tullia tullia*, with its black and white wing markings, and the two tiny *Diplacodes* species, *D. nebulosa* and *D. trivialis*. Also present were *Crocothemis servilia, Trithemis pallidinervis* and the inevitable *Pantala flavescens.* On one of the hotel lawns was a bevy of, apparently, lazy-flying butterflies which turned out to be dozens of *Rhyothemis variegata variegata*, a beautiful insect but a photographer's nightmare, as it habitually perched high in the bushes.

At crack of dawn on the following day (we were to get used to early starts on the organised part of the trip) we left the coast for the Hill Country. We passed through Ratnapura, the centre of the jewel trade, *en route* to Nuwara Eliya, centre of the tea trade. At lunch time we stopped at a road house at Belihul Oya; while eating one of many delicious curries on the terrace overlooking a small torrent, we saw a number of *Calopteryx*-like insects with metallic green flashes on their dark wings. Post-lunch inspection proved them to be *Euphaea splendens*; despite careful searching, only males were found.

Nuwara Eliya was a frustrating stop: lots of wonderful habitat but no chance to investigate as we were "just tourists". It was not until we reached our next hotel stop on the Mahaweli Ganga outside Kandy that we had any chance to swing a net - and then but briefly. Along the banks were more male *E. splendens* and a *Libellago* species which I never managed to capture for identification. The next tourist destination was an Elephant Orphanage at Pinnewala: here we were herded to see elephants being bathed, elephants being fed, etc. I managed to escape downstream and away from the crowds to find abundant *N. t. tullia, P. flavescens, E. splendens* and yet more net-shy *Libellago sp.* An interesting find in the gents lavatory at the restaurant was the only specimen of *Copera marginipes* of the trip. Is this is typical habitat?

Following the four formal, organised days of the visit, we were to have ten days of relaxation in an hotel on the beach at Kosgoda, south of Colombo. Here, at last, although the species were less diverse and interesting than those we might have seen in the hills, we could explore at our own pace. The hotel lay between a beach and a lagoon, and the sandy spit separating the two was home to a number of species. Most common were *Orthetrum sabina sabina, Agriocnemis pygmaea* and, interestingly, *Tholymis tillarga*, the females of which seemed quite active in mid-afternoon; more typically, the males were only seen at dusk. The lagoon, on which we were treated to an outrigger cruise by a local fisherman (typical of the friendship extended by many Sri Lankans - he even provided 'packed lunch' of King Coconut from his own garden) produced many of the aforementioned species as well as *Brachythemis contaminata* and, among the Mangroves, *Pseudagrion microcephalum*. Smaller pools and ditches in the area produced *Orthetrum pruinosum, Trithemis festiva, Anax guttatus, Tramea limbata, Potamarcha congener* and *Ceriagrion coromandelianum.* Perhaps the best momento is a slide of *P. congener* dated "25.12.97" - not a date an Englishman associates with dragonfly photography!

Sri Lanka is a country that would certainly repay further odonatological exploration. The people are delightful and welcoming - and prepared to indulge us in our pursuit. The species in the uplands are fascinating and under-studied - even Col. Fraser, who wrote the most extensive work on the area, worked to a considerable extent on secondhand, preserved specimens. There are whole families, e.g. Platystictidae, that we didn't manage to see. One day we will return.

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*Tragically, **Terence de Fonseka** died in April this year, a month before his long-awaited book "The Dragonflies of Sri Lanka" (ISBN 955-9114-19-0) was published by WHT Publications (Pte) Ltd, 95 Cotta Rd, Colombo 8, Sri Lanka. The book, which is available through Farah Tennakoon at **faraten@sltnet.lk**, deals in depth with Sri Lanka's 117 species, 52 of which are endemic to the island. It is illustrated with excellent line drawings and 38 of the species are shown in colour. Price US$50 / £35. + postage. The work is a must for those travelling around the region of the Indian sub-continent.*
Terence will be sadly missed by many of us and our sympathy goes out to his widow Irangani and his son Nahil. Editor

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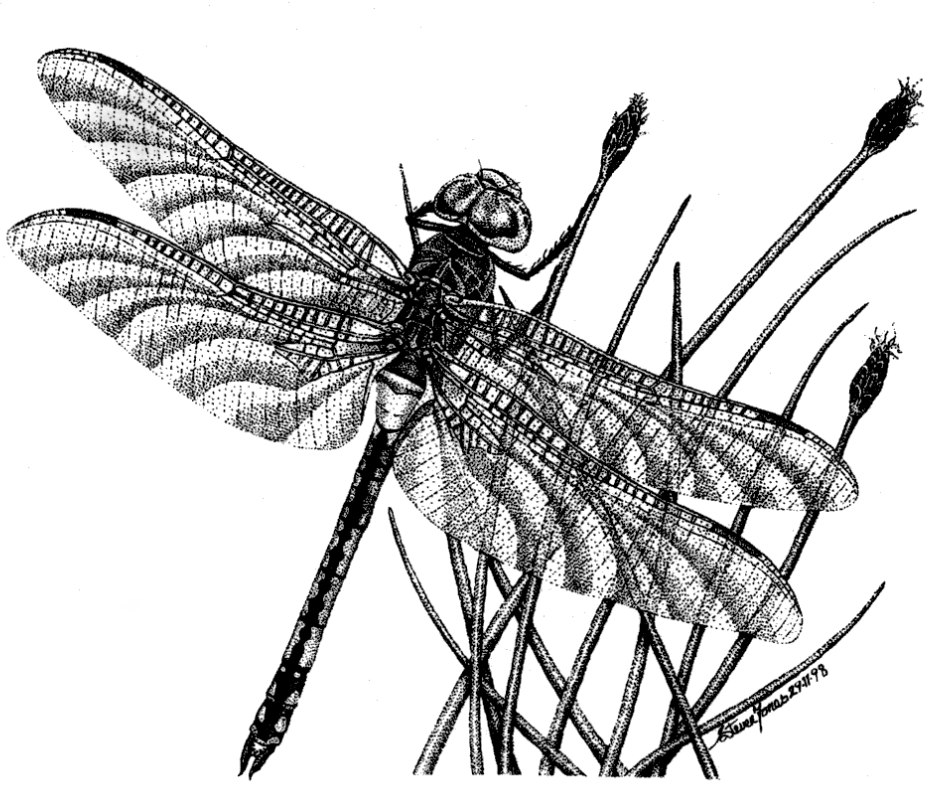
FURTHER OBSERVATIONS on *PETALURA HESPERIA* BEHAVIOUR - Jan Taylor

Before Christmas (1999) I was able to revisit my "top end" Pinjarra site which is mainly made up of an area of wet Agonis scrub beside a temporary stream. I made some more observations on *P. hesperia* which seemed to confirm that they are mainly active in the middle of the day on days when the temperature is over 30°C and that they don't seem much worried by wind. Several times I've seen them flying and settling *in copula* but I have never seen them flying in tandem. I have twice found males struggling in an area of open water dug out by the forestry department to aid fire fighting: one hot day I noticed an individual on a shrub by the water; he flew round the pool and then took five dips (to cool off?) before returning to his perch. This kamikaze behaviour may account for the ones stuck in the water - one dip too many perhaps? I also found four new locations, three of which were within a few k. of the site near Pinjarra, so maybe part of the same population, but the fourth was quite distant and by a fast flowing stream (Little Dandalup Creek) with relatively narrow boggy sides.



This lovely picture of *Hemianax ephippiger* is copied from one of Steven Jones' prints. Thank you, Steve!

HEMIANAX EPHIPPIGER in BRITAIN and EUROPE - Adrian Parr

The Vagrant Emperor, *Hemianax ephippiger* has long had a special place in the hearts of European dragonfly enthusiasts. It is about the only truly afro-tropical migrant to turn up regularly in Europe, and is the only dragonfly species recorded from Iceland, from where there are several records during the period September to November. In Britain the species is now recorded just about annually, with the most recent sighting being made by WDA member Steve Jones in Cornwall on 21 June 1998. Interestingly, whilst prior to 1983 all British records were made either during autumn (as with the Icelandic records) or winter, since then summer records have come to predominate. Perhaps the range or behaviour of the species is altering slightly in response to climatic change?

In recent years *H. ephippiger* has been recorded on a number of occasions in Europe. Two events in particular come to mind. During the summer of 1995 far larger numbers than normal invaded central and northern Europe, and breeding took place at scattered localities throughout much of the continent. Larvae were even found as far north as the Danish sland of Bornholm. The other highlight of recent years has been the occurrence of several individuals during the depths of winter. One was found in Devon (England) on 8 January 1992 and, between mid-January and mid-March 1998, over twenty dragonflies were noted in southern England, with records again being concentrated in the Devon region. Since these 1998 sightings were mostly made by members of the lay public (dragonfly enthusiasts in the more northern parts of Europe being noticeably inactive at this time of year!) only one individual was positively identified as *H. ephippiger*, but it seems likely that most, if not all, were this species. Further south in the Charente-Maritime region of France a specimen was also found during late January 1998.

Hemianax is an interesting dragonfly to us Europeans; with its ability to turn up almost anywhere, at any time of year, it holds a certain elusive charm. Those who have seen individuals can count themselves particularly privileged. I'm still waiting for mine.

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HELP REQUESTED or OFFERED

Philip Corbet still wishes to be informed of corrections needed to his recent book "Dragonflies. Behaviour and Ecology of Odonata" (1999). He is grateful to those who have answered his previous appeals and the resulting Corrigenda is now published on our web pages (**see foot of p.28)**.

Peter Mill requests information of any kind on *Calopteryx splendens* and *Pyrrhosoma nymphula.*

Norman Moore (The Farm House, 117 Boxworth End, Swavesey, Cambridge CB4 5RA, UK) would much appreciate habitat descriptions, for *Aeshna isosceles* outside England.

Hans-Klaus Pfau. "I am seeking MALE dragonflies of all non-European groups (incl. genera), preserved in alcohol (or preferably in Bouin's solution or similar). Most appreciated at the moment are Amphipterygidae (Philoganga) and Polythoridae + Euphaeidae." Rathenaustrasse 14, D - 65326 Aarbergen, GERMANY. Phone: +49 6430 7227

GALLIVARE in 2001 - Anna & Göran Sahlén

Gallivare is being readied to host the 2nd WDA International Symposium of Odonatology in July 2001 **(21st - 27th)** and to welcome odonatists and their families from all over the world. The small town lies 100 km north of the Arctic Circle, in the centre of the vast wilderness of Lapland. It is surrounded by coniferous and mountain birch forests, tundra-like bogs, snow clad mountains, lakes and rivers with cold, clear water, eminently fit for drinking. Its latitude would suggest extremely low temperatures but the Gulf Stream makes the climate surprisingly mild. Around Gällivare you can experience total freedom - and listen to a silence you did not know existed!

The Gällivare Folkets Hus will be the venue of the Symposium. This is a modern conference centre in a charming wooden building. Sessions will be held in a big lecture hall with room for up to 200 participants; another smaller hall will be used for workshops, board-meetings and other activities; poster presentations will be displayed in the spacious foyer where "*fika*" (coffee, tea, soft drinks and traditional Swedish "*kaffebröd*") will be served between sessions.

During the Symposium Dr Ulf Norling will hold a small **workshop on larvae**, giving an opportunity for people from all over the world to get together for discussions on methods of identification, excursions and other activities pertaining to the aquatic stages of Odonata. Those interested in participating should contact the Organisers or Ulf directly by e-mail at Gem.Norling@mailbox.swipnet.se

There will be two **field trips** during the Symposium itself and a **Post-Symposium Tour** is offered from July 28th to 31st. Other interesting activities will be available in and around Gällivare during the Symposium.

If you are considering attending, we would appreciate an advanced, non-binding notification of your interest. **A preliminary form can be downloaded from our Webpage** (see foot of p.28) **or obtained from us.** You will then receive all forthcoming information either by e- or snail-mail. The preliminary registration will give us an idea of the number of participants, the type of accommodation preferred and the topics to be discussed. Those requiring a formal **Letter of Invitation** should contact Dr Gordon Pritchard, Dept. of Biol. Sciences, Univ. of Calgary, Alberta T2N 1N4 (e-mail: gpritcha@ucalgary.ca) Information in greater detail can be found on the web site (foot of p.28) as well as facts regarding accommodation, food, recommended clothing, travel to the Symposium and an interesting background to Lapland, its people, its history and its culture. We (Anna and Göran) will be happy to answer queries on all these subjects, and any others, by e-mail (or by ordinary mail should you be without access to the Internet).

We both look forward so much to welcoming everyone that can make it to Sweden in July next year.

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WELCOME to NEW MEMBERS

AUSTRALIA
Richard Rowe, Zoology Dept., James Cook University, Townsville, Q.4811
BELGIUM
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Tony Mundell, 38 Conifer Close, Church Crookham, FLEET, Hants GU13 0LS **Dr Jon Pickup**, 8 Craigcrook Road, Edinburgh, EH4 3NQ
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Philip Crowley, Center for Ecol., Evol., & Behavior, Univ. of Kentucky, Lexington, KY 40506-0225
Loretta Osakwe, Curriculum Dept., East Orange School District, 715 Park Ave., East Orange, NJ 07017

Changes of Address
Gianmaria Carchini, Univ."Tor Vergata", Dip.Biologia, Via della Ricerca Scientifica snc, I-00133, Roma, Italy
Steve Krotzer, 53 Wilson St., Brent, AL 35034 USA **Ole Fogh Nielsen**, Tulstrupvej 112, 8680 Ry, Denmark
Martin Peterson, Storgatan 26 C, 672 30 Årjäng, Sweden **Fred Sibley**, 2325 County Road 6, Alpine, NY 14805, USA

Resignations: Dr Guenter Bechly, Germany; Dr Ann Cloarec, France; Bob Honig, USA

EUROPEAN REGIONAL MEETING - July 7th to 9th

The.weekend, organied by Wolfgang Schneider, will be packed with activities including guided tours of all things odonatological (and other things!) in the Museum, sessions of informal slide presentations from members, and outings to dragonfly sites and other places of interest. Regional meetings are informal, friendly gatherings and are held with the aim of encouraging the making of new, and the renewing of old, friendships. There is still JUST time to register. Jill Silsby

As the Meeting is an informal gathering of WDA members, participants will receive a definite schedule of events only upon arrival. The Meeting will convene on Friday 7 July at 9.00 a.m. for a welcome reception in the entrance hall of the Hessisches Landesmuseum. For the three days the following activities are planned: guided tours in the museum (dragonfly objects in the Fine Art Department, the Odonata collection, Messel pit exhibition), a field trip to a nearby dragonfly site, and a visit of the famous Messel pit, a UNESCO World Heritage Site, where well-preserved fossils in oil-shale have been unearthed. So far, participants have agreed to give slide presentations on their recent research trips, e.g. to Ghana, East Africa, and Brazil!

Accommodation Most registered members have booked a room in the "Bockshaut", a hotel in walking distance (5 minutes) to the Museum; reduced rates (including breakfast and 10% discount on all meals) apply to all WDA members: single DM 95, double DM 130. The hotel has a nice restaurant with good German cuisine and an excellent selection of local wines! For reservation contact me or directly: "Bockshaut", Kirchstrasse 7-9, 64283 Darmstadt, phone +49-6151-9967-0, fax +49-6151-9967-67, e-mail BOCKSHAUT@AOL.de There is no nearby camping site, but cheap rooms (several persons to a room) are available in the youth hostel, again in walking distance to the museum: "Jugendherberge am Woog", Landgraf-Georg-Strasse 119, 64297 Darmstadt, phone +49-6151-45293 or 47034, fax +49-06151-422535.

How to get to Darmstadt and the Hessisches Landesmuseum? By air: You will arrive at Frankfurt Intl. Airport (Terminal 1 or 2), Darmstadt is about 30 km to the south; a taxi should not cost more than DM 70. But you can also reach Darmstadt with a bus shuttle service (every 30 min), the "AirLiner", leaving in front of terminal 1 (there is a shuttle train from terminal 2 to terminal 1 every two minutes). The final bus stop in Darmstadt is "Luisenplatz", about 200 m from the museum. Should you need assistance for accommodation or transport please contact me: phone (office): +49-6151-165707, fax +06151-165765, mobile +49-(0)172-6832366 (at any time!), e-mail W.SCHNEIDER@HLMD.TU-DARMSTADT.DE or FRI.WOL@t-online.de. **See you in Darmstadt!** Wolfgang Schneider

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IMATO SONEHARA : an appreciation - Hidenori Ubukata

Imato Sonehara, an active Japanese odonatologist and the author of 'The Life History of *Epitheca bimaculata sibirica* at Mt. Yatsugatake [OdA4001], died aged 79 years as a result of a traffic accident on 12th May 2000. He was born in 1921 in Nagano prefecture. After World War II he entered the Temporary Training School of Science Teachers, attached to Hokkaido University. Graduating therefrom in 1948, he worked as a science teacher in several junior and high schools in Nagano pref. until his retirement in 1981. He started his career as an odonatist in 1961 by surveying the odonate fauna in the vicinity of Saku city. In 1962 he found there a few good *Aeshna mixta* habitats (a rare species in Japan) and then started, under the supervision of Dr Syoziro Asahina, his study on its behaviour and life history, the results of which were published in *Tombo* vols. 7, 11 and 14. Appreciating his contribution to the biology and conservation of the species, Dr Asahina (1988) named *Aeshna mixta soneharai* for Japanese subspecies. Sonehara also studied the life history of *Epitheca bimaculata sibirica, E. marginata, Sympetrum danae, Ictinogomphus clavatus, Somatochlora arctica, Mortonagrion selenion* and *Coenagrion terue.* One of his last odonatological works was coauthored by me, his son-in-law. Thirteen among his 63 published works on odonata were cited in Dr Corbet's (1999) book.

References: Asahina (1988) Gekkan Mushi, 211: 11-20. [OdA6461]; Corbet, P.S. (1999) Dragonfies: Behavior & Ecology of Odonata. Cornell Univ. Press

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IMPORTANT REMINDERS

1. Members are reminded that new "Instructions for Authors" have been prepared and are posted on our WDA web pages (**see below)**. All potential contributors to *Pantala* are hereby requested to consult and follow them before preparing MSS for submission. Members without access to the Internet should write to the Editor for a hard copy: Dr Henri. Dumont, University of Gent, Ledegankstraat 35, Gent, Belgium.

2. This current issue of AGRION and its accompanying Odonatological Abstracts will be posted on a secure site on our pages. They will available to all paid-up members who ticked the relevant box on the renewal forms and sent their e-mail address to Rob Arnold. Members who would like to be added to the list should contact Rob via our homepage (see below)

3. I didn't appreciate, when I thought up the theme "**My Most Beautiful Odonate**", just how difficult it would be to make a choice. I could pick so many from the spectacular species I have been privileged to see around the world. The widespread Asian calopterygid *Neurobasis chinensis* which was described by Needham in his China Manual 1930 as "one of the most beautiful insects in the world" is certainly one and this genus includes other species that have been acclaimed by odonatist friends as their candidate for the title: the Borneo endemic *N. cyaneipennis* is the choice of Allen Davies and of Bob Kemp; the endemic Philippines *N. luzoniensis* is Matti Hämäläinen's choice and the Australian *N. australis* is Stephen Richards' favourite. Other members of the same family I have seen and marvelled at are undoubtedly contenders: Japan's *Calopteryx cornelia* is outstandingly beautiful as is Europe's *C. haemorrhoidalis*, whilst southern China's *Echo (Archineura) incarnata* is a favourite of Keith Wilson's. And these all come from just one family! Chlorocyphidae includes a multitude of beauties (*Cyrano unicolor* and *Platycypha fitzsimmonsi* are my favourites here), as does Euphaeidae *(Euphaea refulgens*!), Synlestidae (*Chlorolestes fasciata*!) and Lestoideidae (*Diplebia euphaeoides*!).

Nor must the anisopterans be neglected: there are lovely aeshnids (America's *Anax longipes* is a favourite of mine), spectacular living examples of Gondwanaland's ancient neopetaliids and petalurids as well many, many startlingly beautiful libellulids: what could be more lovely than Australia's *Rhyothemis graphiptera* with its gold filigree wings set with glowing amethysts, or America's *Celithemis elisa,* with its ruby patches? The Philippines' *Neurothemis ramburi* is spectacular as is Africa's *Urothemis assignata,* and America's *Perithemis tenera* is a tiny jewel beside the banks of many a pond. I have run out of superlatives!! My own choice will be revealed in the next issue of AGRION - together with those of as many readers of this newsletter as possible. So don't forget! Anyone with anything to write on the subject of **BEAUTIFUL ODONATES**, send it to me for inclusion in the next issue of AGRION**. By the end of this coming October please.**

I hope you'll enjoy doing this and know that we will all enjoy reading your contributions. *Jill Silsby*

4. IMPORTANT WEB SITES **W.D.A. Home Page: http://powell.colgate.edu/wda/dragonfly.htm**
Gallivare Symposium: http://powell.colgate.edu/wda/sweden.htm