

T. Donnelly

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## THE DRAGONFLY SOCIETY OF AMERICA

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CONSERVATION OF THE TROPICAL RAIN FOREST AND ITS RICH ODONATE  
FAUNAL DIVERSITY IN RONDONIA, WESTERN BRAZIL

Thomas C. Emmel

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Since 1987, a series of entomological expeditions has explored the region around the Fazenda Rancho Grande, near Cacaúlândia, in the central part of the state of Rondonia, western Brazil. Intensive field work has been underway there since March of 1989, with three to four expeditions a year, including not only lepidopterists but also distinguished odonate specialists such as Sidney W. Dunkle, Minter J. Westfall and Rosser W. Garrison. This region apparently has the highest butterfly diversity per square kilometer in the world, with an estimated 1,500 to 1,600 species residing within several square kilometers in the Rondonia rain forest around the Fazenda Rancho Grande. The number of Odonata species recorded here now exceeds 135 and may reach 160 species.

In addition to documenting this incredible diversity, it was also clear as early as our 1989 visit that this rich rain forest was about to disappear under the hand of man, through cutting and burning of the forest to create temporary crop land and nutrient-poor pasture. During a November 1989 expedition to the same area, with 26 lepidopterists and other entomologists, a Florida high school student assistant of mine, Leslie L. Groce, became so inspired by the apparent need to do something to save this rain forest before it disappeared that in an evening at the Fazenda, he declared he was returning to Gainesville to raise money via his high school student conservation club towards the purchase of land there.

This positive expression stimulated other members of the group that month to start intensive discussion about the options that might exist to save a significant portion of the area in a large reserve, and an informal group continued extensive discussions and exchange of ideas with Harald

Schmitz (the Brazilian owner of Fazenda Rancho Grande) upon their return to the United States that winter. Through the cooperation of the University of Florida Foundation, an SOS Rain Forest Fund was set up there in January 1990 to receive contributions for preserving the rain forest in Rondonia.

Since then, more than \$20,000 in donations has come in from people across the U.S. and from Canada as well, and we were able to set aside the first 250-hectare parcel (640 acres) in March 1991. A second parcel was in the process of being purchased during September-October 1991, and negotiations are underway for additional parcels. We expect to be able to purchase relatively large areas of rain forest because the price of some of these uncut forest tracts is as low as \$4 per acre during the current economic situation in Brazil. With the areas we are currently purchasing, because of their superb forest and central location, the price ranges between \$30 and \$100 an acre, still a low cost for tropical rain forest in the Americas.

While the state of Rondonia occupies some 93,840 square miles (243,044 square kilometers) in the southwestern part of the Amazon Basin in South America, large-scale human settlement really only started in 1975, and yet more than 21% of the original rain forest has already been cleared-- mostly in the past several years! The incredible butterfly diversity of central Rondonia was first documented by T. C. Emmel and G. T. Austin (1990, "The tropical rain forest butterfly fauna of Rondonia, Brazil: Species diversity and conservation" published in *Tropical Lepidoptera*, 1(1): pp. 1-12, with a list of over 840 species identified as of October 1990. Subsequent expeditions in

November and December 1990, and again in March and April 1991, have raised that total to over 1,143 identified species inhabiting the area around the Fazenda Rancho Grande Field Station. We confidently project that the "final" list will amount to around 1,600 butterfly species!

Simultaneously with the purchase of land to increase the size of the reserve, we have helped to establish (March 1991) a Brazilian foundation, FAUTRON, in the state of Rondonia, to actually hold the land in perpetuity and preserve it under Brazilian law, free of taxes, squatters, and other dangers.

The Fazenda Rancho Grande, a 750-hectare tract (1,875 acres) owned by the Harald Schmitz family, has also provided a long-term, no-cost lease on a parcel of land immediately adjacent to the reserve. On this tract of land is being constructed a modern new field station, with accommodations for approximately 32 people, a laboratory building with an air-conditioned room for computers and other instrumentation, and plenty of work table space and sinks with running water to deal with both aquatic and terrestrial samples.

When complete, the field station complex will include four new housing units of four large double, or triple, occupancy rooms. Each cabin will have a wide, shaded veranda, adequate for protection from the sun and for outside sorting work on tables. All rooms will have desks and table space inside for working on insect collections. Inside bathroom facilities will also be included in each cabin building. A formal laboratory building for general visitor use will include facilities for a variety of research needs, from table space for visiting groups of entomologists or botanists, to complete microcomputer facilities in an air-conditioned room, and will include a freezer, refrigerator, rearing cages, etc., for long-term scientific visitors such as students, retire (but very active!) individuals who want to pursue a research project, university scientists, museum curators, and others from throughout Brazil and elsewhere in the world. A separate dining hall, lecture room, and kitchen will be added later. Currently, there are older housing facilities with shared bathroom and shower facilities, a very nice family dining room and deck area in the main ranch house area, and adequate work space for sorting on tables.

Lepidoptera surveys and some initial Odonata surveys have been made within a radius of about 10 kilometers in all directions around the Fazenda,

which at the central ranch house lies at latitude 10° 18' S. and longitude 62° 60' W. The terrain is typically low, rolling hills or flat plains covered with wet tropical rain forest, except in areas of human disturbance. The elevation in the area ranges from 160 to 350 meters.

During the last two months of 1990, a total of 17 kilometers of trails were constructed through the rain forest on the Fazenda, opening a wide range of habitats to exploration by interested naturalists. The trails are numbered and marked at each intersection so that remarkably precise records may be kept on locations of netted specimens or sightings. Numerous small forest streams, larger rivers, and ponds are abundant during the wet season from June through early September the smaller bodies of water dry up and only the larger rivers remain flowing.

People interested in working on Odonata and other insects at the Fazenda Rancho Grande may arrange stays through Holbrook Travel (3540 NW 13th Street, Gainesville, Florida 32606). It is also possible to write directly to Harald Schmitz in Rondonia, but direct communication by mail or telephone is presently still fraught with many delays and is not particularly recommended unless you have a lead time of at least six months or so.

Odonata specialists who would be interested in being on the mailing list for reprints of publications on the Rondonia Rain Forest Reserve area and other information pertaining to the SOS Rain Forest Project, including the Biological Field Station, may write to the author of this article with such requests. We welcome any and all entomologists and other naturalists interested in supporting this project financially, and/or in visiting the station themselves to sample the incredible Odonate diversity of this fascinating part of the world!

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## QUESTIONS AND ANSWERS ABOUT TROPICAL RAINFORESTS

(Information furnished by  
Rainforest Action Network)

Where are tropical rainforests  
and how much remains?

Rainforests girdle the Earth in a 3,000 mile-wide green band that straddles the equator. Rainforests once covered at least 14% of the Earth's terrestrial surface. Now only 6%- or less

than half the original acreage - remains in rainforest. Brazil contains one-third; Indonesia and Zaire each have ten percent of what's left.

#### Won't the rainforest grow back?

Not with its original diversity of plant and animal life. Some rainforest ecosystems have been evolving for 70 to 100 million years and contain many species that exist nowhere else. These species exist in a complex and delicate balance. When large areas are deforested, many become extinct. At the same time, when fragile rainforest soils are exposed to the sun and rain, they erode quickly. When grazed by cattle they become compacted and sterile. When the trees are removed, rainfall patterns change and aridity may set in. All of this adds up to the creation of deserts where formerly the world's richest ecosystems lived.

#### Why are the rainforests so important?

Rainforests are a vital organ in the planet's life-support system and play a central role in regional and global climate control. They maintain and conserve soils and regulate hydrological cycles, thus ensuring fresh water supplies. They provide the sole habitat for over half of the species on Earth, and the ancestral homelands for millions of forest people who rely on them for physical and spiritual sustenance.

Rainforests also provide foods, medicines, and other products for the industrialized world. Since rainforests constitute the Earth's primary gene pool, their destruction will have incalculable economic as well as biological consequences. Their destruction is also contributing to the greenhouse effect (25% of greenhouse gases may be attributed directly to the burning of rainforests and cleared debris!), depletion of the ozone layer, and global climate change.

#### Why are the rainforests being destroyed?

Misconceived Third-World development schemes are the main cause of tropical deforestation. Many of these projects are actually being financed by U.S., European, and Japanese taxes and by private banks based in the industrialized countries. The most destructive projects are road building, logging, mining, hydro-electric dams, and development of large agricultural and cattle ranching projects. All of these play a role in the destruc-

tion of Latin America's rainforests. In Southeast Asia, Oceania, and Africa, logging and agriculture are the primary causes.

#### How long has this been going on?

The beginning was 500 years ago when Europeans began to colonize the tropics. However, the indigenous peoples themselves were the main casualties until the industrial revolution brought in bulldozers and chainsaws that were capable of wholesale exploitation of the rainforests. After World War II, the destruction accelerated, and most of the loss has occurred just since 1960.

#### Isn't overpopulation the real cause of deforestation?

Overpopulation is often cited as the primary cause of settlement and agricultural development in rainforest areas, but inequitable distribution of the better agricultural land in tropical countries is even more responsible.

Many governments use rainforests to defuse movements for land reform. Rather than instituting land reform on prime agricultural lands, they relocate landless peasants to the rainforests where they have no option but to practice slash-and-burn clearing to homestead plots for subsistence agriculture. Because most rainforest soils are depleted rapidly, the peasants must move further and further into the rainforests in an endless cycle of burning and depletion.

However, blaming Third-World peasants for rainforest destruction is like blaming foot soldiers for war. In Brazil 4.5 percent of the land-owners control 81 percent of its farmland, and 70 percent of the rural households are landless.

#### Why don't rainforest soils make good agricultural land?

The heat and heavy rainfall in most tropical regions act to leach the nutrients out of the ancient soils very rapidly, only the top few inches of most rainforest soils contain good fertility. Most of the nutrients are in the biomass - the vegetation covering the ground. When the rainforest is intact, leaves and other organic material fall to the ground where they are recycled through complex interactions among microbes, plants, insects, birds and other animals to constantly replenish soil nutrients. However, when the rainforest is destroyed, not only is this replenishing process elimi-

nated, most of the nutrients and the complex interactions of the biomass are forever lost in the burning process. The bare soil's nutrients are rapidly leached out and it is subjected to erosion from the heavy rainfall.

**Are there environmentally safe ways to utilize these vast rainforests for profitable enterprises?**

That depends on how it is done. First of all, rainforests *already* make an incalculably valuable contribution to the planet's ability to support life forms, and this must be the overriding factor in deciding what, if any, economic development can safely be tolerated. Intact rainforests are hardly idle. They provide absolutely essential environmental services for the continued well-being of humans and all life forms. Services such as air, water, and climatic stability, not only in adjacent regions but world-wide. This is a primary reason why conversion of rainforest into farmland and pasture is not only of local concern, but is a vital concern of all countries on Earth.

Large-scale economic development of the rainforests has succeeded only in redistributing wealth upward, not outward to the people who could benefit most. Contributing instead to a downward cycle of poverty and ecological degeneration. The desired widely distributed benefits of permanently intact rainforests are being converted into short-term profits for the very few, with no concern for long-term biological damage that is incalculable, irretrievable, and tragic.

On the other hand, by eliminating slash and burn clearing, selectively harvesting timber products only in prescribed areas, and extracting known, and potentially discoverable, renewable natural resources, the projected long-term revenue return is several times greater than revenues that can be generated from clear-cut logging and cattle ranching.

**Isn't it unrealistic and patronizing to protect indigenous tribes from 20th century progress?**

Tribal groups have successfully occupied rainforest territories for hundreds or even thousands of years and nearly all the remaining rainforests are the ancestral home-lands of one group or another. The question is not whether they can adapt to the 20th century without losing their cultural identities and skills, but whether they will be allowed to do so. Cultural extinction is not inevitable. If indigenous groups are allowed to

retain their traditional lands and are protected from newly introduced diseases, are given time to adapt and allowed to determine their own futures, they can contribute much more to dominant societies than they can after they've become refugees, the dependent victims of disastrous development schemes.

## THE AMAZON RAINFOREST REGION

Once a vast sea of tropical forest, the Amazon rainforest today can be compared to a moth-eaten carpet, the dense green pocked and scarred by roads, farms, ranches and dams. The Amazon Basin encompasses areas of Brazil, Venezuela and Colombia and the eastern Andean region of Ecuador and Peru, covering 484 million hectares. Almost all of South America's rainforests are found in the Amazon Drainage. Brazil is gifted with a full third of the world's rainforest. It is also one of the world's greatest destroyers of rainforests, burning or felling 3.6 million acres each year (The Institute for Food and Development Policy: *Brazil: A Paradise Lost?*).

The Amazon Basin formed in the Paleozoic period, somewhere between 500 and 200 million years ago. The extreme age of the region in geologic terms has much to do with the relative infertility of the rainforest soil and the richness and unique diversity of the plant and animal life. There are more fertile areas in the Amazon River's flood plain, where the river deposits richer soil brought in from the Andes, which only formed 20 million years ago.

Today at least 15 percent of rainforest in the Amazon Basin has been razed (*Christian Science Monitor*: "The Endangered Amazon".) Just over 15 years ago, in 1975, only five percent of the Amazon had been cleared. The pace of destruction is still increasing. More rainforest was cleared in each of the last five years than any previous year, and 1991 is expected to have seen the felling of an equally large amount. Frequently in the last decade travelers in Central Brazil have reported many of the region's major cities choked with smoke, and sometimes airports in the states of Rondonia, Acre, Para, Mato Grosso, and Amazonas have been forced to close because of smoke from burning forests. Most forest clearing is being done for large scale cattle ranching, mining projects, logging, government road building, hydroelectric dams, military operations, and to a lesser extent, subsistence farming by peasants and landless settlers.

The destruction is based on a common attitude among governments in rainforest regions of the world that the forest is an economic resource to be harnessed to aid in the development of their countries. The same attitudes prevailed in North America 200 years ago as our frontiers were being expanded westward. The major differences were that our soils are deeper and had vastly greater productive longevity, even so, it required expensive government conservation projects and dedicated efforts on the part of American farmers to remedy the onset of catastrophic soil losses beginning in our "dust-bowl" era. Could any Third-World countries afford such massive conservation programs when their own "dust-bowls" occur? Or will they simply clear more rainforest?

The rainforests were first called jungles, which comes from the Sanskrit word "jangala", meaning desert or wild place. The myth and mystique of the dark jungle, uncivilized and dangerous, is common to all cultures. The destruction of the rainforest follows the familiar pattern that has occurred throughout history - of seeing natural land and indigenous peoples as resources to be used for the benefit of the colonizers. Again similar attitudes are to be found today in some countries as were experienced in the colonization of our own West, this is exemplified by much Brazilian sentiment that "until all Amazonas is colonized by real Brazilians, not Indians, can we truly say that we own it?".

Obviously, rainforests are not idle lands, nor are they uninhabited. Indigenous peoples have lived on the land, hunting, gathering, and practicing primitive farming in a complex sustainable relationship with nature. They have developed over time technologies and systems for the most efficient use of resources available in the rainforest. Their knowledge of natural resources that may be found in the forest is impressive: Indian tribes of the Amazons are known to use over 1,800 plant species for medicinal purposes (*Science Magazine* 2: (10)).

In 1500 there were an estimated six to nine million indigenous people inhabiting the rainforests in Brazil. By 1900 there were only one million or less. Today there are probably less than 200,000 tribal people still surviving. About half of the estimated original 230 tribes have completely disappeared. Today more of these tribal people are endangered or pressured from encroachment upon their habitat than any time this century. The greatest threat is encroachment on their territory

for economic development.

As a safety valve for the demands of millions of landless peasants, colonization of the rainforest allows the government to avoid the reality of needed land reform. The problem of landless is not one of over-population. According to a 1982 U.S. State Department Survey, "those countries in which current forest harvesting is of greatest concern (Indonesia, Brazil, Malaysia, and Colombia) have relatively low population density." Even with all Amazonas excluded, Brazil has a population density no greater than the United States. Each person could potentially have 10 acres of farmland (Caufield, C., 1984, *In the Rainforest*). In actuality, a mere one percent of the landowners in Brazil own half of all the arable farm land in the country.

In the past twenty years, 24 million farmers have been forced off their land by increasing production costs and falling sales prices for their products. They gather around the cities in *favelas*, or slums. The large consolidation farmers, or land speculators, control the price of arable land. Instead of land reform, the government pushes schemes for colonization of rainforest territory by these displaced farmers, but after only a few crops the fertility of the soil is exhausted. The farmers move further into the forest to clear and burn off a new homestead, and the abandoned cleared land is acquired cheaply to become part of a large cattle ranch.

Even so, the majority of the destruction in the Amazon Basin is not due the slash and burn agriculture of peasant farmers, but to the much larger scale operations of the cattle ranchers and land speculators who burn huge areas to be planted with hardy varieties of African grasses for cattle pasture. In Brazil, as in most Latin American countries, for settlers to legally occupy land they must "improve" it.

The quickest and easiest method of complying with this law is to clear the land of trees, in remote areas where roads have not been constructed yet even valuable hardwood logs are burned!

Cattle ranching for beef export has undoubtedly been responsible for the greatest decimation of Brazil's rainforest, according to Brazilian Government figures almost half of the deforestation in the Brazilian Amazon Basin occurring over the past 25 years can be attributed to large scale cattle ranching. The Brazilian government has

given fiscal incentives to 90% of the large ranchers who have established spreads in forest areas, but less than half of the landless have received any incentives for homesteading under government sponsored programs.

Many World Bank financed projects impact upon tropical rainforests. In Brazil, the proposed Carajas mega-project, an open-pit iron mining operation poses a serious and far-reaching threat. Aside from the destruction of rainforest in the immediate mining area, this requires the building of access roads, supporting facilities, and iron ore smelters which will use vast amounts of charcoal to be produced from timber cut from the rainforest.

Hydroelectric projects funded by the World Bank can become another serious threat. The Tururui Dam displaced 25,000 people and submerged 900 square miles. At least 125 more dams are planned to bring electricity and industry to the Amazon Basin. They can flood as much as 9 million square kilometers of forest, and displace more than 500,000 people. Brazil has in excess of 100 billion in foreign debt, a sizable portion of its GNP each year goes just to service the interest on this debt. In order to earn the foreign exchange necessary to service this massive debt, Brazil is in the position of needing to greatly increase exports. So it supports and subsidizes all export-oriented business for the short-term gain, in the face of certain destruction of what is its most valuable long-term asset-- the rainforest. Because of Brazil's abundant natural resources, it is a prime target for developmental projects financed by big business in Japan, United States, and Western Europe.

National security has been offered as another excuse for the occupation and destruction being carried out in the Amazon. The Brazilian military is establishing posts throughout the territory near the borders with Colombia, Peru, Surinam, and Venezuela as part of the Calha Norte project. Their goal is to construct military bases, schools, clinics and airstrips in the territory in order to establish a presence and gain actual control over the frontier as first steps to opening the area to colonization. Mining in the Amazon Basin for its valuable resources is expanding. Since 1987, when gold was discovered on land occupied by Yanomami people, as many as 40,000 gold-miners have poured into the area. Mercury is used in the extraction process, poisoning the rivers and effecting downstream ecology. New diseases brought in by

the miners are a serious threat to the tribes people, and conflicts between the two groups have resulted in killings.

#### WHAT CONSEQUENCES DOES THE EARTH FACE FROM CONTINUED DEFORESTATION?

Deforestation affects climate significantly, in part because the forest plays an important role in the water cycle. The forest acts as a watershed, in times of high rainfall it absorbs water like a sponge, slowly releasing groundwater back into the atmosphere - to fall as rain another day - perhaps even on another continent. The shifts in weather patterns caused by mass deforestation cannot be foretold with certainty, conceivably drought or flooding could be caused in another hemisphere. The burning and felling of rainforests is also exacerbating the "Greenhouse Effect" - the releasing of heat-trapping carbon dioxide into the atmosphere. Forests burned in the Amazon are releasing 10% of the world's total released carbon dioxide.

Deforestation robs the world of countless life forms each year, many are species not yet identified by scientists, thus destroying crucial biodiversity that will never evolve again and leaving no record of its ever having existed. Potentially useful species for medicine, agriculture and industry may be becoming extinct before they are discovered. Deforestation threatens many tribes of indigenous peoples, both their cultural heritage and their very survival.

Development as it is occurring today in tropical Third-World countries with rainforest tracts may make economic sense to them in the short term, but their policies are certain to lead to disaster if continued indefinitely. For those who would like to see a text-book example of what happens to the economy and ecology of a territory when 90% of its forest lands are decimated, I recommend a hard look at the Malagasy Republic. For the rest of the planet, the risks are far too great to accept without intervention on all possible levels.

#### THE BOTTOM LINE:

Are we really interested enough to become involved? Should we become involved? Is there anything that we can personally do?

These are not difficult questions to answer. There are a lot of people and organizations who are really interested in this situation, and who



have already become deeply involved. Rainforest Action Network, 300 Broadway, #28, San Francisco, CA 94133, is the international organization that is spearheading and coordinating the worldwide effort to save the rainforests. There are one or more local organizations in nearly every country devoted to this cause, and information about them can be obtained from the above office.

Should we become involved? How can we not be involved, actively or passively, every person on Earth will sooner or later be effected by the planet's environment. The longer we can maintain a friendly environment here the longer we will have a living ecology, I don't know what life's destiny will be when man finally corrupts our environment beyond repair. Educate yourself about our need to preserve sufficient forest lands to serve environmental needs. Educate yourself about the political and economic causes of our ever-worsening environmental crisis. When you have formed strong opinions, make your opinions known to friends, editors, and those who represent your interest in elected office.

Will we become personally involved? For me the inspiration to get involved on a personal level was the passage in Prof. Emmel's article in this issue, where he recounted the motivation experienced by his student assistant, Leslie Groce. Upon seeing the extent of rainforest destruction in Brazil, he declared he was returning to Gainesville to start a fund towards purchasing land for a preserve in Rondonia. Single-handed he had an idea to start a revolution! That's dedication!

Prof. Emmel has become personally involved to the extent of founding the SOS Rain Forest Fund at the University of Florida, and the FAUTRON Foundation in Brazil. None of these people are naive enough to believe their organizations are going to completely turn around the situation in Brazil and save all rainforests, what they do believe is that every acre added to the preserve helps the overall picture that much - "from small acorns, great oaks grow."

I believe it is entirely appropriate that our society become involved in the Rondonia project to the fullest extent possible. Some of our people have visited the area and have returned with rave reviews about the odonate fauna there. I will welcome constructive input from the DSA membership. Wouldn't it be great for DSA to buy a nice little steam property down there dedicated to conserving it's odonate population? Editor

## 1992 ODONATA MEETINGS

### THE NORTHEASTERN ODONATA COLLECTORS' MEETING, PATUXENT WILDLIFE RESEARCH CENTER, MAY 23-24, 1992

Richard L. Orr  
9334 Farewell Rd., Columbia, MD 21045

The Patuxent Wildlife Research Center (PWRC) is located about mid way between Washington, D.C. and Baltimore, Maryland just a couple of miles east of the Baltimore/Washington Parkway on HWY 197 (Laurel-Bowie Road).

The Center is situated in the Patuxent River watershed and shares with the Beltsville Agricultural Research Center (BARC) the largest existing continuous forested preserve in the region.

The site is only a few miles from the inner boundary of the Atlantic Coastal Plain and resides within the Fall-line Clay Hills District. The rocks and soil have a joint ancestry belonging to the Atlantic Coastal Plain, but mix liberally with deposits from the Piedmont Plateau. The principal formations are the Arundel and the Patapsco.

The PWRC is designated as a Central Pine-Oak region which is an ecotone between the Upper Austral Zone (Central Hardwoods Region) and the Lower Austral Zone (Southern Pine-Oak Region).

The Center has two lakes. Lake Redington which covers 22 acres, and Cash Lake which is the largest body of water on the site at 58 acres. Numerous smaller ponds were created at PWRC for migratory waterfowl by Federal WPA projects during the Great Depression and these ponds have been managed and kept isolated from the general public every since. The ponds are varied in depth, size, type of floating/emergent vegetation and degree of management practices. The combined area of the ponds totals over 200 acres. In addition, large areas of temporary ponds and permanent swamps exist. The Patuxent River flows through PWRC maintaining its integrity for about a third of the distance and then becomes a braided stream creating numerous smaller streams of various sizes.

Probably the most significant feature of the area as it relates to the odonate assemblage still present is that, coupled with Fort Meade on the north and BARC on the south, it has been protect-

ed from development which engulfed most of the Washington D.C. area. The Patuxent Wildlife Research Center is still actively isolated from the general public by being completely fenced in by the U.S. Department of the Interior, Fish and Wildlife Service.

The major function of the PWRC is research on migratory birds and endangered species (the sounds of whooping cranes often permeate the air). Permission to enter is done by permit only (generally limited to research scientists) and the Center is actively patrolled for trespassers.

When you add up all these factors -- what it gives you is a unique opportunity to study the Odonata fauna at what may very well be the last remaining unimpacted site in the Washington, D.C. area. I have already recorded 90 species from the Center in only the two years that I have collected here. I fully expect that in 1992 I will break the 100 mark without too much difficulty. Here is the list of species taken so far:

*Tachopteryx thoreyi*; *Aeshna mutata, umbrosa*; *Anax junius, longipes*; *Basiaeschna janata*; *Boyeria vinosa*; *Epiaeschna heros*; *Gomphaeschna furcillata*; *Nasiaeschna pentacantha*; *Cordulegaster bilineata, maculata, obliqua*; *Gomphus (Phanogomphus) exilis, lividus*; *Hagenius brevistylus*; *Progomphus obscurus*; *Stenogomphurus rogersi*; *Stylurus laurae*; *Didymops transversa*; *Macromia georgina, illinoensis*; *Epicordulia princeps*; *Helocordulia selysi*, *Somatochlora linearis, tenebrosa*, *Tetragoneuria cynosura, spinosa*; *Celithemis elisa, eponina, fasciata, martha, verna*; *Erythemis simplicicollis*; *Libellula auripennis, axilena, cyanea, deplanata, flavida, incesa, luctuosa, lydia, pulchella, semifasciata, vibrans*; *Nannothemis bella*; *Pachydiplax longipennis*; *Pantala flavescens, hymenaea*; *Perithemis tenera*; *Sympetrum ambiguum, obtrusum, rubicundulum, semicinctum, vicinum*; *Tramea carolina, lacerata, onusta*; *Calopteryx maculata*; *Archilestes grandis*; *Lestes congener, disjunctus australis, eurinus, forcipatus, inaequalis, rectangularis, vigilax*, *Amphiagrion saucium, Argia apicalis, bipunctulata, fumipennis violacea, tibialis*; *Chromagrion conditum*; *Enallagma aspersum, basidens, civile, daeckii, divagans, exsulans, geminatum, signatum, traviatum, vesperum*; *Ischnura hastata, kellicotti, posita, ramburii, verticalis*; *Nehalennia integricollis*, and *irene*.

Dr. Holliday H. Obrecht, of the U.S. Fish and Wildlife Service, has given permission for the

Northeastern Odonata Meeting to be held at the PWRC. A log cabin with 6 bunks, kitchenette, showers (everyone will need to bring their own towels), and a meeting room is being provided at no cost. In addition, people can also sleep on the floor, setup tents on the lawn in front of the cabin, or opt for a nearby hotel. The log cabin is located at entrance #2, which is just past the main entrance (#1) on HWY 197.

The closest hotel is the Red Roof Inn, 12525 Laurel-Bowie Road, just a couple of miles from the PWRC. Reservations can be made for the hotel by calling 1-800-843-7663. Their rooms will cost about \$40.00.

The meeting participants will have access to nearly the entire Center for collecting on Saturday and Sunday. If you have questions about PWRC or the area please feel free to contact me at: Home Phone (410) 730-7290 or Work Phone (310) 436-8939. (Please note that I have recently moved and the address and phone numbers listed in the last issue of **ARGIA** are no longer in effect, these should be changed to match those given in this article).

Dr. T.W. Donnelly, 2091 Partridge Lane, Binghamton, NY 13903, phone (607) 722-4939, should be contacted if you plan to attend. Nick is keeping a list of those who are coming and information on (approximately) when they expect to arrive. Nick will have the gate key which allows entrance into PWRC, including the log cabin, and will attempt to be available for your arrival.

## SECOND NEOTROPICAL ODONATOLOGIST MEETING: SECOND AND FINAL ANNOUNCEMENT

E. Gonzales S. and R. Novelo G.

First author: Instituto de Biología, U.N.A.M.,  
Departamento de Zoología,  
A.P. 70-153, C.P. 04510, Mexico, DF, MEXICO

As we announced in **SELYSIA** 20(2), the Second Neotropical Odonatologists' Meeting will be held at Los Tuxtlas Station in Veracruz, Mexico on 13-18 July 1992. Although the topics of the meeting have not been formally settled, some items for discussion may be the following:

1) Current status of knowledge of the Odonata of Mexico. 2) Recent advances in taxonomy of troubled genera of neotropical dragonflies (e.g. *Argia*, *Palaemnema*, etc.); and 3) reproductive

biology of neotropical dragonflies -- state of knowledge and groups that need to be studied. At this moment any ideas on other points for discussion are very welcomed.

Oral presentations are planned to be held at the afternoon sessions. During the mornings some workshops and collecting is planned. Cost of lodging (with three meals included) will be very affordable in Mexico, the approximate cost will be around \$35.00 - \$40.00 US per day. Persons interested in attending are asked to please contact us AS SOON AS POSSIBLE. (Dr. Gonzalez may be contacted by phone at one of the following numbers: Office - 550-52-15 Ext. 4908. Home - 680-61-90. Dr. Novelo may be reached by phone at (281) 8-60-00, or FAX (281) 8-69-10. Editor).

**THE DRAGONFLY SOCIETY OF AMERICA'S  
THIRD ANNUAL COLLECTORS MEETING,  
MERIWETHER LEWIS MONUMENT-LAUREL  
HILL WILDLIFE AREA, TENNESSEE  
JUNE 12-14, 1992**

Carl Cook  
469 Crailhope Road, Center, KY 42214

For those who enjoy collecting and photographing gomphines, or just observing a wide array of these splendid dragonflies, a visit to Tennessee in June is an unforgettable experience. I am not sure if there is any other place where it is possible to observe two unique endemic gomphines on the same day and at locations less than 40 miles apart. That is one of the more fascinating things about this area, the Highland Rim section of mid-southern Tennessee, where our meetings will be held. Although only a hand-full of the areas' numerous streams have had the Odonata populations sampled, the discovery of two endemic species-- *Gomphus sandrius* and *Ophiogomphus acuminatus* in only the last decade, is indicative of other possible treasures that may await discovery roundabout of this interesting locale.

Disregarding the host of widely encountered species also present here, some of the more desirable things that I've seen or collected in the general area are: *Calopteryx angustipennis* (their abundance is unbelievable!); *Enallagma divagans*; *Tachopteryx thoreyi*; *Boyeria grafiana* (June may be too early!); *Gomphus quadricolor*, *sandrius*, *viridifrons*; *Gomphurus crassus*, *fraternus*, *hybridus*, *lineatifrons*, *vastus*, *venticosus* (the last two have "good" and "poor" years-- unfortunately, 1992 comes in the midst of their "poor" cycle),

*Ophiogomphus acuminatus*, *rupinsulensis*, and *incurvatus/allghaniensis*? (I have the larvae of a form belonging in this species complex-- maybe this will be the opportunity to discover the adults); *Lanthus parvulus/sp.nov.*? (the form taken in this area is on the borderline between "true" *parvulus* and the variant under study by Sid Dunkle-- hopefully participants can collect some additional material to aid Sid's project); *Hagenius brevistylus*-- if you enjoy seeing or catching this big fellow-- there is more of them on the streams in this area than I have ever seen anywhere else); *Cordulegaster maculata* (very common here earlier-- mostly gone by mid-June however), *erronea* (the right time of season, but I haven't found a real good population yet-- let's go out and find their favored streams!); *Macromia alleghaniensis*; and *Libellula flavida*.

After the meeting's end on June 14th, Ken Tennessen, myself, and probably Nick Donnelly, will guide post-meeting trips to other locations or to search for specific species if there is interest in doing so. We will welcome suggestions from participants as to where they would like to visit or what species they want to collect. Some possibilities are the western Tennessee locations for *Arigomphus maxwelli* and *Neurocordulia molesta*, with the option of extending it a couple of days to go on to the Ozark region of Arkansas. Another possibility is the eastern Tennessee sites for such species as *Calopteryx amata*, *Stylurus scudderi* (too early?) and *Stenogomphurus consanguis*, with the further possibility of extending it to include a day or two in western North Carolina.

Nick Donnelly has expressed keen interest in exploring some of the fine little streams of the Cumberland Plateau of north-central Tennessee, which includes the habitats for *Stenogomphurus rogersi* and *Stylurus laurae*. I am sure he would welcome reinforcements from anyone interested in accompanying his party.

**Generalities of the meeting:** The meeting location will be Shadow Acres Motel, in Hohenwald, Tennessee. I or another DSA representative will be on hand at the motel beginning 12:00 noon on Friday, June 12th, to register and assist participants as they arrive. A block of rooms has been set aside at this motel for the use of participants but, it will be the responsibility of each participant to contact the motel of choice and make their own reservation. The mailing address is Rt. 2, Box 179, Hohenwald, TN 38462, and phone (615) 796-2201. Be sure to mention that you are attending

the "DSA Convention" to qualify for room discount.

In view of the fact that Shadow Acres may be too small to house all anticipated attendees, another local motel (the only other near Hohenwald) will serve as the reserve. It is Swan View Motel, on Route #412, 8 miles East, and close to the junction with Natchez Parkway. The phone is (615) 796-4745. Also, on the accompanying "Registration Form" is a listing of "name" motels in the nearby Columbia area should anyone wish to make other arrangements.

For those wishing to camp or park motor-homes, there are very good camping facilities at Meriwether Lewis National Monument off Natchez Parkway, 5 miles South of the junction with US HWY #412, which junction is 8 miles East of Hohenwald. I stay at this campground myself for several days nearly every summer, there is no charge, an ample number of spaces, and I have never known it to be fully occupied.

Although Hohenwald is a rather small country town (about similar to Grantsburg, WI for those of you who attend last years' meetings), I believe no problems should be encountered in getting there. I will presume that every one will focus on Nashville, TN as the nearest large city. From Nashville take Interstate 65 South about 35 miles to Exit #46 (Columbia-US Hwy #412 Exit), then West on #412 about 40 miles to Hohenwald. In route along #412 you will pass the Swan View Motel and upon reaching Hohenwald turn North on Route #48 and go about 2 miles to reach Shadow Acres Motel.

The customary DSA informal agenda will be observed-- business matters as brief as possible, informal presentations on anything you would like to talk about or show (projector will be available, so bring those slides!). If you have questions call me at (502) 565-3795. See you all in Tennessee!

### **A COLLECTORS' GATHERING IN TRINIDAD?**

**John Michalski**

90 Western Avenue, Morristown, NJ 07960

Caroline and I have been visiting her home in Trinidad this January, and we spent part of that visit looking into the logistics of hosting a collectors' gathering there. If you haven't seen any of my scribblings on Trinidad yet, the basic stats are that Trinidad is a tropical, English-speaking island, 30 x

50 miles in size, ten degrees north of the Equator, with odonate species numbering about 130. On a short trip a busy gang of collectors should be able to net upwards of 75 species, and who knows how many more?

The fiscal details aren't plentiful, but here they are: Airfare from the New York City area continues to hover around \$450 round trip. If the group stays at the (somewhat run down) Simla Tropical Research Station, the rate is US \$15 per day, but we, as a group, will have to do our own groceries and cooking and so forth. The living conditions are somewhat spartan but comfortable, and the location is magnificent - smack in the middle of a beautiful mountain rainforest, with fantastic bird watching and good rivers for bugs nearby. Caroline and I can manage the actual food shopping at regular intervals. Figure your share of the grocery bill based on what you'd pay at home. You can cook for yourself, or we can prepare authentic Caribbean cuisine for the stout of heart.

I believe bed sheets are provided at Simla, and two shower stalls and a bathroom are available. There is some fairly unadorned "lab space" but not much, if any, equipment. The place can hold up to 30 people, with more than two to a room. The following figures aren't carved in stone, but it seems that the group could hire out a minibus (what is called a MaxiTaxi) with driver for around \$400 Trinidad dollars per day, which currently comes to about US \$80. One MaxiTaxi would suffice for at least ten people, so that's US \$8 apiece per day, or something like that. So equipped, we can visit any location on the island that the collector or sightseer would wish to.

What we need is an idea of how many people are interested in making this trip. We don't know exactly when to hold the gathering, but we probably can't make it in 1992 at all. Bug-wise, June is about the perfect month, but there really is no bad season to collect in Trinidad.

As far as cost is concerned, we really can't swing any discounts for a larger group, so the number of people participating doesn't change anything except the reservations we will ultimately make for cars and lodging. As this will take a lot of letter writing to organize, please let us, or Carl, know what you think as soon as possible, so we can get down to brass tacks.

We can be contacted at the address above, or by phone at (201) 829-0094.

## TAXONOMIC PROBLEMS (?) WITH *TETRAGONEURIA*

Thomas W. Donnelly

2091 Partridge Lane, Binghamton, NY 13903

I have recently been going over many of my older North American odonate specimens and have encountered problems with some of them. There are two types sorts of problems: (1) How do you tell species A from species B? (2) Are species A and B really valid species anyway? The second is the more interesting question, and it seems to me that we do not review often enough the criteria by which we might find an answer. My own view is that ideally A and B, to be considered valid species, must be reproductively isolated. If they are sympatric it is often relatively easy to arrive at an answer to the question. If they are generally allopatric and grade together where they co-occur, then we might infer that they are not reproductively isolated, that their gene pools are not isolated, that they should be regarded as the earlier products of some isolating event, and that they are no longer isolated; in this case, I prefer to think of them as subspecies.

Recently (ARGIA 3:4) I raised some questions with regard to *Sympetrum* and *Plathemis*. This time I present another sort of problem: The status of some *Tetragoneuria*. I am interested in the *cynosura* "complex", which contains *cynosura*, *costalis*, *semiaquea*, *petechialis*, and *spinigera*. In case you are wondering why I am not including *sepia* and *stella*, there is no good answer; I am simply not directly familiar with either. *T. sepia* seems a perfectly good species; *stella* seems to me to be an excessively pale *cynosura*.

Concentrating for the moment on the first five species, *spinigera* is fairly quickly recognized as a good species on the basis of the spine on the superior appendage and the shape of the abdomen.

The remaining four species are often separated, at least in part, by the wing maculation. I regard this as wholly unreliable in all these species. I once bred a large number of *cynosura* from the same small pond; upon emergence they were either unspotted or heavily spotted (*simulans*). I could not explain then nor can I now why the two forms persist. I have seen them together equally in New York and in Louisiana and Texas. Intermediates are not so common as one would suspect. The species *semiaquea* is generally heavily marked on the hind wing. Yet, I have one specimen from the Pine Barrens with essentially no wing markings.

Similarly, the species *petechialis* may have its famous lovely spots on the antenodal crossveins, or it may be unmarked

I find that the male superior appendages to be generally reliable, but not completely. This is a situation that recurs throughout the cordulids. I believe the problem with over-reliance on the superior appendages is that these are inflated during ecdysis, and they are capable of being inflated a little too much or perhaps not quite enough. Their degree of swelling and their central flexure may vary as a result. (The same thing happens in *Macromia georgina* and *illinoisensis*.) The species *costalis* and *petechialis* tend to have appendages that are less divergent, seen from above, and *semiaquea* and *cynosura* are more divergent. There is a lateral carina better developed on *cynosura* than on the other species, but this is also variable. There is a ventral keel on *cynosura* and *costalis*, virtually no keel on *petechialis* and no keel at all on *semiaquea*.

I find that the relative width of the abdomen, best seen from below, is a powerful character for separating these species. I offer sketches of five species, showing that the basal section of the abdomen is narrowed in *spinigera* and *costalis*, much less narrowed in *petechialis*, parallel-sided in *cynosura*, and is actually swollen in *semiaquea*. Of this group of species, the two that seem closest are *costalis* and *petechialis*.

The purpose of this note is only partly to ask for readers' comments on these criteria. I have found from conversations in the field with various people at various times, that my criteria is not necessarily yours. Do you have better criteria?

Females are even more difficult. I find the length of the superior anal appendages sufficiently variable that I would not like to rely on it. The vulvar laminae are not often variable, but distressingly often twisted or distorted in my specimens. In fact, a large number of my female specimens are somewhat teneral and have distorted abdomens. Do we take mostly teneral females but mature males?

The real purpose of this note is to report that I seem to have a specimen intermediate between

*cynosura* and *petechialis* from San Jacinto Co. TX, where *cynosura* is very common. I have taken *petechialis* no closer than Gonzalez County, which is several hours drive away. The specimen in question has the abdomen of *cynosura* but appendages very close to those of *petechialis*. What I am fishing for is any indication anyone may have that some of these species are not genetically very separated, and that *petechialis* and perhaps *costalis* might be races of *cynosura* in peripheral parts of its range. I also raise the question with regard to *stella*, noting that it occurs in half a dozen counties in Florida which also harbor *cynosura*.

I would appreciate any comments you might have regarding my sketches, criteria, or questions.

Also, what do you think of the idea of an issue of the **BULLETIN OF AMERICAN ODONATOLOGY** devoted to only *Tetragoneuria*, with contributions from several people?

#### REMINISCING 1991: ADVENTURES OF THE MICHALSKI'S

John and Caroline Michalski  
90 Western Avenue, Morristown, NJ 07960

Our collecting season begin with an early start in Florida. By February I was good and stir-crazy and needed badly to swing the net. In mid-March (18-24) we took the Amtrak down to Florida, and Sid Dunkle showed us around Gainesville and Clay County. In between we visited with Jerrell Daigle out in Tallahassee, and we collected in the sand hill lakes out in the panhandle. We met with Minter Westfall over at DPI and generally had a good time all around. In five days of collecting, the species seen or taken included:

##### In the Gainesville area:

*Enallagma sulcatum, durum, doubledayi, pollutum, daeckii* (saw teneral?); *Ischnura prognata, hastata, kellicotti, posita & ramburi*; *Calopteryx maculata*; *Cordulegaster sayi*; *Gomphus minutus, cavillaris, australis* (exuviae & teneral); *Tachopteryx thoreyi* (saw at least one but caught none); *Anax junius & longipes*; *Nasiaeschna pentacantha, Coryphaeschna ingens*; *Didymops floridensis, Epithea sepia*; *Ladona deplanata*.

##### In the Leon County/panhandle area:

(the weather was against us) *Argia fumipennis atra*; *Enallagma doubledayi*; *Anax longipes*; *Gomphus cavillaris brimleyi*; *Epithea costalis*; *Ladona deplanata*; *Tramea carolina*.

##### In the sand lakes of Clay County:

*Calopteryx maculata, dimidiata*; *Hetaerina titia*; *Argia fumipennis atra, tibialis*; *Enallagma durum, davisii, concisum*; *Ischnura ramburii, hastata*; *Gomphus cavillaris*; *Anax junius*; *Didymops floridensis*; *Epithea sepia*; *Celithemis ornata*; *Erythrodiplax minuscula*; *Ladona deplanata*; *Tramea carolina*.

We had a great time and would welcome the opportunity to visit again. Thanks again, Jerrell and Sid!

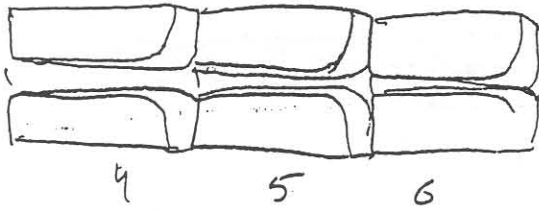
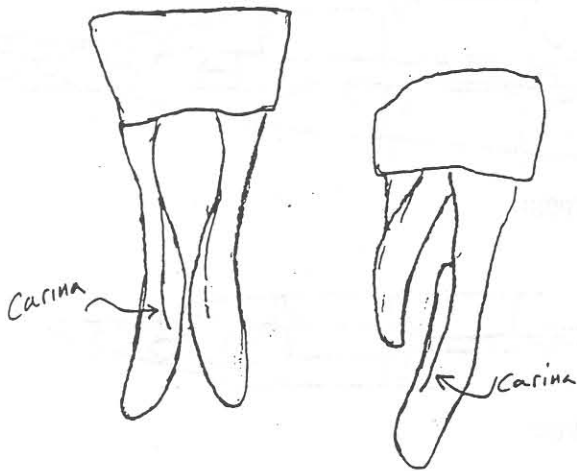
##### New Jersey

In mid-May we had the pleasure of hosting Gert von Rosen, a collector from Germany, for a weekend of collecting around New Jersey. Gert was luckier than he could have realized, as the weather had been unusually warm and sunny and the bug season was easily several weeks early, so mid-May was ideal for a collector with so little time to get around. We went to my three favorite New Jersey locales (which we have described in an earlier issue of **ARGIA**).

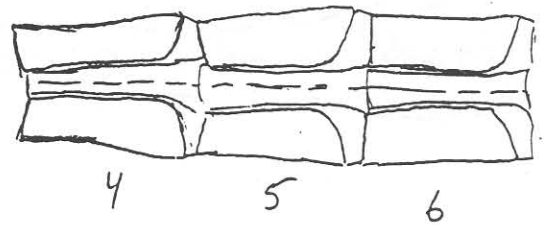
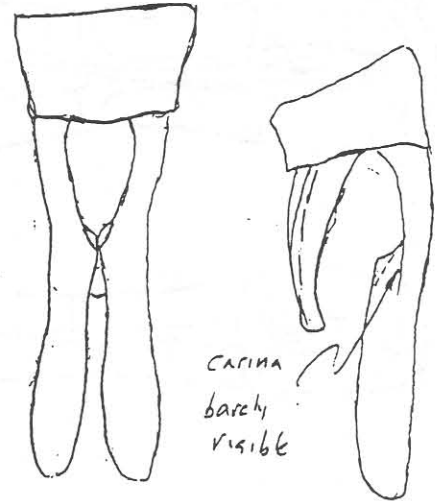
In two days (May 25-26), Gert and I saw or collected at least 52 species: *Lestes vigilax*; *Calopteryx dimidiata* (saw one), *amata, maculata, aequabilis*; *Ischnura kellicotti, posita, verticalis, hastata*; *Amphiagrion saucium*; *Enallagma laterale* (?), *civile, recurvatum, vesperum*; *Chromagrion conditum*; *Nehalonia gracilis*; *Argia bipunctulata* (teneral only), *violacea*; *Gomphaeschna furcillata*; *Epiaeschna heros* (seen); *anax junius*; *Basiaeschna janata*; *Aeshna mutata*; *Arigomphus villosipes*; *Gomphus lividus, exilis*; *Ophiogomphus* sp. (seen); *Cordulia shurtleffi, Helocordulia uhleri*; *Epithea cynosura, canis*; *Dorocordulia lepida*; *Didymops transversa*; *Cordulegaster diastaiops* (seen), *maculata*; *Perrithemis tenera*; *Plathemis lydia*; *Libellula flavida, pulchella, quadrimaculata, cyanea, semifasciata, vibrans* (seen); *Celithemis verna*; *Erythemis simplicicollis*; *Pachydiplax longipennis*; *Ladona julia, exusta, deplanta*; *Nannothemis bella*; *Leucorrhinia intacta*. It was a great weekend and I think we both had a splendid time.

In June Caroline and I joined the other DSA

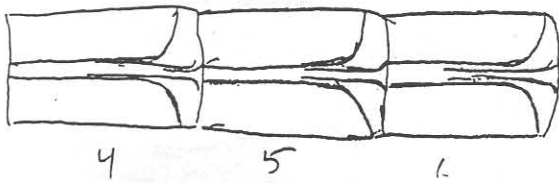
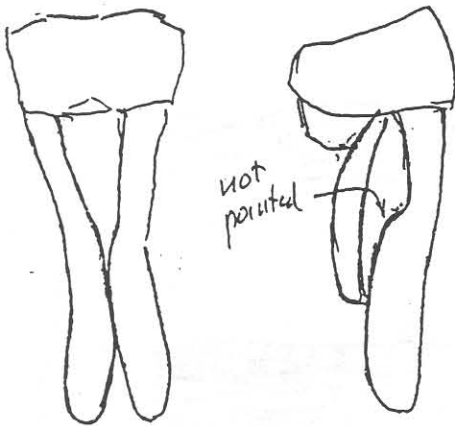
T. W. Donnelly: *TETRAGONEURIA*



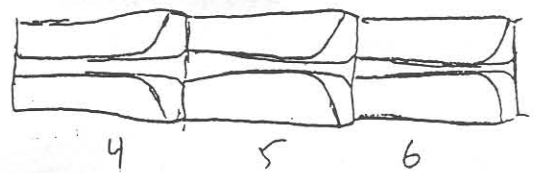
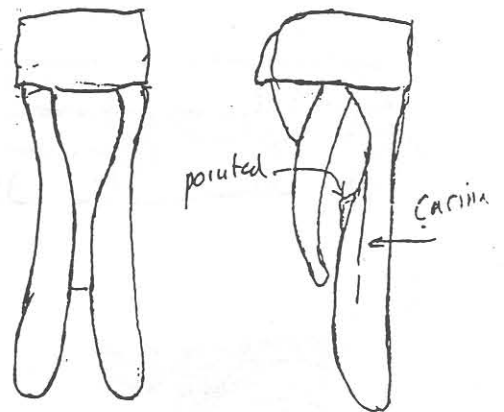
*Tet. cynosura* (66X001)  
San Jacinto Co., TX



*Tet. cynosura* (60X012)  
San Jacinto Co., TX

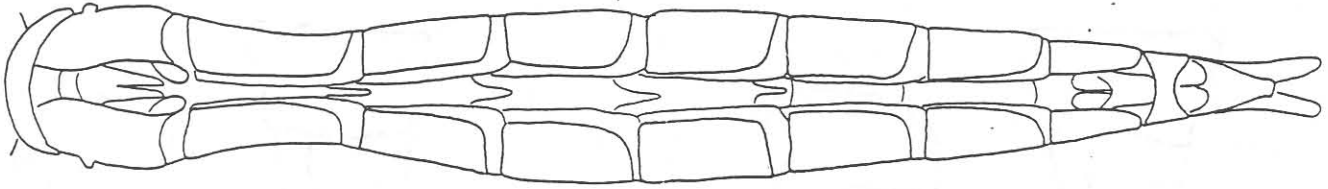


*Tet. petechialis* (61X005)  
Uvalde Co., TX

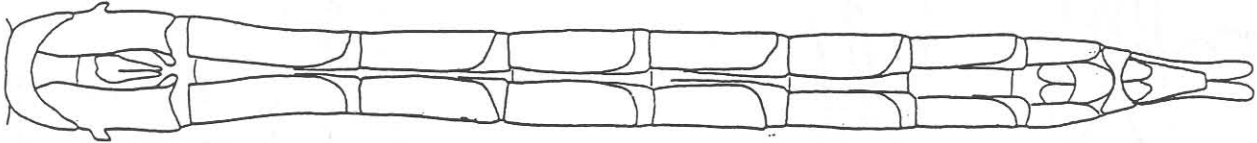


*Tet. costalis* (56X008)  
Jackson Co., AL

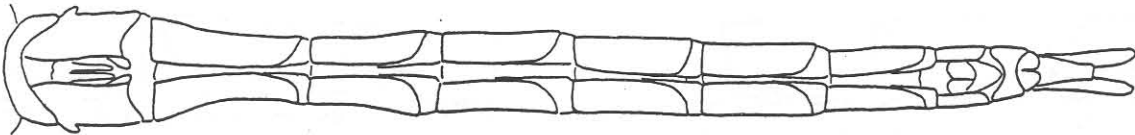
T. W. Donnelly: *TETRAGONEURIA*



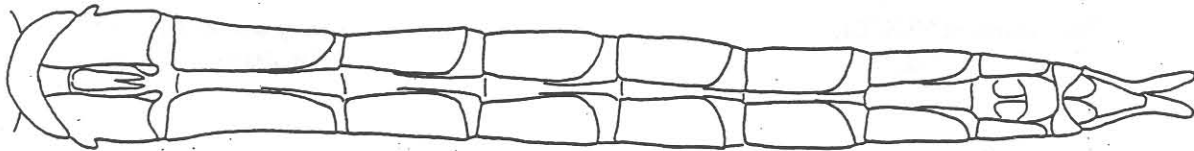
*spinigera* (84X026)



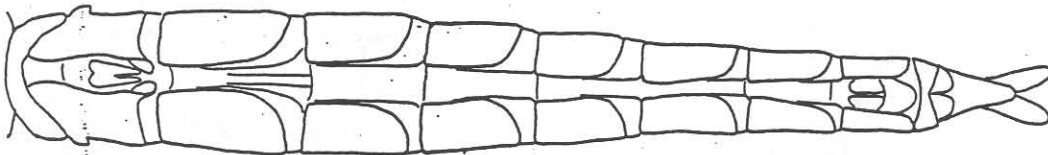
*petechialis* (61X005)



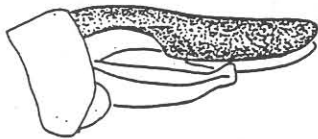
*costalis* (56X003)



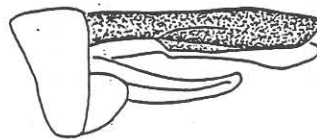
*cynosura* (66X001)



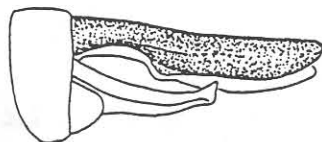
*semiaquea* (91X003)



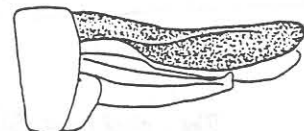
*petechialis* (61X005)



*cynosura* (66X001)



*costalis* (56X008)



*semiaquea* (91X003)



members for the Pine Barrens and Grantsburg, Wisconsin gatherings, but after then saturation set in, so apart from these outstanding trips we did almost no collecting the rest of the summer. We look forward to summer 1992.

### THE CONTINUING SAGA OF SPUR LAKE ROAD, OR "THE GREAT BEAR STORY"

Jerrell J. Daigle

2166 Kimberley Lane, Tallahassee, FL 32301

Like every one else attending the Grantsburg meeting last summer, I was blasted. Whoops! I mean had a blast! Seriously folks, Dr. Westfall and I managed to collect about the same species that everybody else got at the St. Croix River and at Spur Lake Road near Dunbar. We stayed an additional day or two after most others had gone and continued to collect around the Spur Lake vicinity. We were able to add a few additional species to the reported total. Near the one of the little streams crossed by the road we collected *Cordulegaster obliqua* and *maculata*, and along Spur Lake Road itself we added *Somatochlora williamsoni* bringing the total somatochlora species count to six for that one location.

Thereby hangs "The Great Bear Story" for which I've received numerous threats to life and limbs (well-- almost!) if we failed to recount the horrendous details for the pages of ARGIA.

By now, nearly everyone has heard one version or another of the "close encounter of the forth kind" experienced by Dr. Westfall and myself on our last day at Spur Lake Road: I was running down the road, with Dr. Westfall close on my heels, we were trying to net a slow flying *Somatochlora kennedyi* overhead, when I happened to glance back over my shoulder and laid saucer eyes upon an oncoming black bear loping along right towards us! If the episode were ever to be made into a motion picture called Ungentle Ben our ensuing conversation might be used for the script, and went something like: "Minter! Lookout! Bear! Bear!" Dr. Westfall said "Where! Where!" I said "There! There! Right Behind Us!" Dr. Westfall said "Oh! Oh!" I said "Run! Run!" We did about 100 yards in what was probably Olympic class time, and-- when we looked back again (fortunately for the bear!) he had decided he couldn't stand any more of our dialogue and turned off into the bushes and trotted away. Well, we decided there were probably more Somatochloras flying at the

opposite end of the road, so we went over there to collect. Needless to say, we were in a heightened sense of awareness the rest of the day!

Near Sayner in Vilas County Tim Vogt showed the party he was guiding a wonderful little stream, Plum Creek at County Road "N" where *Ophiogomphus colubrinus* was supposedly abundant. We reached to site just at sundown and gomphines were already going to roost, but Carl Cook decided to camp there for the night-- when we all arrived back the following morning we found Carl had been collecting since daybreak and had already decimated the *colubrinus* population!

Dr. Westfall and I walked down Plum Creek to where it flows into Plum Lake. There, Dr. Westfall spotted an *Arigomphus cornutus* which he graciously allowed me to catch. We then started finding and catching numerous pairs of *Lestes inequalis* and *Enallagma hageni*. I say numerous because it was past 2:30 AM the next morning before he was finished processing all his specimens and turned out the lights!

Also, we collected *Aeshna canadensis*, *A. umbrosa*, and *Cordulia shurtleffi* back on Plum Creek. Earlier, we traveled with Duncan "The Deerslayer" Cuyler and Tim Vogt to the Peshtigo Reservoir in Marinette County and collected *Arigomphus furcifer* sitting on the lily pads. I introduced Dr. Westfall to the "pan-caking technique of swamping the lily pad perchers: "Ka-Pow! Ba-Boom!" They never had a chance! Westfall "The Terminator" saw to that! He most have splatted and collected at least a dozen specimens, much to the chagrin of a much-soaked me wading nearby. All in all, it was great collecting experience and we had a wonderful time. I can bear-ly wait for the Tennessee meeting and the Mexico trip next summer!

### RESEARCH UPDATE AND CALL FOR HELP

Rosser W. Garrison

1030 Fondale Street, Azusa, CA 91702-0821

#### *Erpetogomphus*

I have almost finished the monograph of the neotropical Gomphid genus *Erpetogomphus*. All of the alpha taxonomy of all 21 species (6 of which are new) is done, involving an examination of almost 1300 specimens. There will be over 200 figures. The last part of the work to be done is the

cladistic analysis, which I am working on now.

#### Particular Problems Which Remain Unresolved

1. *Erpetogomphus elaps* complex. I believe that two species exist under this name, and would very much like to see specimens of this taxon from Guerrero, Oaxaca, Chiapas states, Mexico, and from Guatemala.

2. I have yet to find a bona fide record of *Erpetogomphus compositus* from mainland Mexico. Can any of you help me here? Surely this common species must be found at least along the northern states, because I have it from border areas of Texas, Arizona, and California.

3. The latest specimen of *E. cophias* was collected in 1941. The species is known from only 11 specimens. Has anyone collected this rare species? My records indicate a distribution confined to the highlands of west-central Mexico south of 20°N and west of 100°W at altitudes of 1525-2438 m.

#### *Argia*

I am finishing up a paper describing two new species of *Argia* from the United States. Both have been known under manuscript names for many years, but they are to be published soon so that they can be available for a forthcoming book on the damselflies of North America by M.J. Westfall, Jr.

The first is a species similar to *A. tarascana* Calvert and is confined to the Sabino Canyon area of Pima County, Arizona. I have sufficient material of this species for description, and I have compared it with the types of *A. tarascana* and *a. lacrimans* (Hagen).

The second is a small species first known from Balmorhea State Park in Texas. It is now known from at least two or three other localities, and the largest series I have is from northern Mexico. Unfortunately, I have not seen the original specimens from Balmorhea S.P., which was going to provide the name for the species. I do not know their whereabouts. I plan to give the species a different name, unless the specimens can be found. I would like to know if any other collections of the species in Texas or elsewhere have been made. There is still time to have your records included in the paper.

#### Records of Arizona Odonata

Besides my own collection, I have examined and identified various Odonata from Arizona in the University of Arizona and Arizona State University collections. The list includes 105 species so far, and I suspect that the following also occur in the state:

*Lestes dryas*, *L. unguiculatus*, *Ischnura parparva*, *Ophiogomphus severus*, *Cordulegaster dorsalis*, *Sympetrum internum*, *S. madidum*, *S. obtrusum*. Does anyone have records of any of these species from the state? I would also like to know of specific recent records of *Libellula composita* and *L. forensis*. Any help or correspondence would be welcome. The data will be used for a paper on the Odonata of Arizona.

#### A CLADISTIC STUDY OF ODONATA

Gunter Bechly

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I am a German odonatologist, member of the SIO and DSA. I have studied Zoology at the Universitat Tubingen, and have just begun with my M.Sc. Thesis under the supervision of Dr. Gerhard Mickoleit, Tubingen. The subject of my thesis is a phylogenetic (cladistic) study of the exant odonate families. I am planning to continue and extend this research with my Ph.D. Thesis. I want to make particular use of new aspects of the following characters: larval and imaginal labium; male and female genitalia; wing-venation and the ultrastructure of the wings.

Of course the success of this research is highly dependent on the availability of specimens of all families and subfamilies that are currently recognized, and also of some genera that are possibly misplaced in the present systemic scheme of dragonflies. Unfortunately I cannot fully rely on museum-collections because the planned examination by S.E.M. can inflict certain "damage" to specimens being studied that is not consistent with usual procedures and the primary purpose of museum material holdings. Also dried material is not suitable for histological studies. Furthermore is even difficult to get local material, because dragonfly collecting is totally prohibited in Germany by a conservation act. Therefore, I am depending now on the help and support of foreign odonatologists and SIO brethren, who are able to send me duplicate specimens of their collections.

I am especially interested in alcohol preserved larvae and imagines of the non-European odonate families and subfamilies. Most important for my

present research would be specimens of the Perilestidae, Chlorolestidae (*Phylolestes*), Pseudolestidae (*Hypolestes*, *Thaumatoneura*), Amphipterygidae (*Amphipteryx*, *Rimanella*), Dicteriadidae, Petaluridae and Neopetaliidae.

Finally, I should like to bring to the attention of odonatological colleagues my intention to establish a Specialist Group for Phylogenetic Odonatology within the SIO. The aim shall be a mutual cooperation of all those odonatologists around the world that are also concerned with phylogenetic research in general and with phylogenetic systematics (cladistics) in particular.

I am currently in negotiations with Prof. Kiauta regarding the details. The group probably can be formally established as early as this summer, certainly not later than beginning of next year, and the first edition of a *Bulletin & Newsletter* can be published. This semiannual periodical shall take the design of *Notulae Odonatologicae*, containing short original papers, critical reviews and related communications.

I would be very interested to communicate with any odonatologists in America who are interested in this project and who have any ideas, suggestions, or proposals they believe will be helpful in this undertaking.

#### FROM THE EDITOR'S DESK

##### Is entomological collecting over regulated?

Every one who has followed my scribblings in this journal, or has heard me speak out regarding some of the so-called biological conservation practices in vogue today, knows that I have very strong convictions about what constitutes truly effective measures and what is purely political frivolity.

Dragonflies are fierce predators of all invertebrates smaller than themselves, and they in turn become important food resources for the higher echelons in the ecosystem. They spend the greater part of their life in the larval stages and are most vulnerable to impaired ecological conditions at this point. Given a clean, stable larval habitat they require no further protection. Imagos reach sexual maturity within several days of ecdysis and most individuals soon become a repast for somebody else shortly thereafter.

Contrasted to higher animals there is no long

lived breeding population to preserve. The survival game for odonates is immense larval populations, an imaginal stage designed for quick reproduction, and rapid attrition. Conservation measures to be effective must be designed to fit the specialized needs of Odonata, simply applying similar measures as those adapted for higher animals is ineffective and sometimes detrimental.

At present, we have no data whatsoever on a possible total population figure for any odonate species in the world nor do we even know the absolute distribution for any single odonate species in the world. As we begin to compile more and more data on supposed "at risk" species I don't know of a single instance where we haven't discovered larger populations and/or more extensive distributions than were previously known. As compared to other biological disciplines odonatology has very few devotees, it is not prudent at this time to impose such severe restrictive regulations that research is hampered.

It is not my intention to dispute the need for biological conservation, it is readily apparent there is already a world-wide crisis. My disagreement is with national and state governments that espouse such overzealous measures as the complete ban on all collecting-- even for scientific purposes. Detailed studies are the starting point to determine the true status of every supposedly endangered life form, and the only means to secure the necessary information for remedial action.

The shortsighted bureaucracy of one country has made it necessary for Mr. Gunther Bechly to turn to colleagues in other countries for the research material necessary to complete his studies. It is such counterproductive attitudes toward the training of their future scientists that educators world-wide must speak out against. How can this have happened in one of the world's most scientifically progressive nations? Shall we soon expect their medical students to be required to import cadavers from abroad to complete their training?

I am sure being given a butterfly net and pinning box at early age has been the introduction to nature study and the biological sciences which influenced choice of careers for many of the world's renowned scientists. Insect collecting has long been a time honored tradition in Europe, perhaps even more so in Germany than anywhere else. I am saddened that German youths no longer have that privilege.

Carl Cook

## NOTICES

**EXCHANGE:** Want to exchange world Odonata. Especially want Gomphidae from anywhere. I have available at all time 1,000-1,200 species available for exchange. Will identify specimens for a share of the duplicates. I especially want examples of the few North American species lacking in my collection: *Ophiogomphus edmondo*, *Somatochlora brevicincta*, *S. septentrionalis*; males of *Macromia margarita* & *rickeri*; female of *Gomphurus lynnae*. Carl Cook, 469 Crailhope Road, Center, KY 42214.

**EXCHANGE:** Want to exchange Odonata from North and Central America and the Caribbean Islands. Jerrell J. Daigle, 2166 Kimberly Lane, Tallahassee, FL 32301.

**EXCHANGE:** I am interested in corresponding and exchanging with anyone interested in neotropical Odonata. My collection from North America is almost complete, lacking is: *Enallagma laurenti*, *Ophiogomphus edmondo*, *Somatochlora brevicincta*, & *S. georgina*. Lacking from the Antilles is: *Enallagma truncatum*, *Telebasis corallina*, *Gynacantha ereagris*, *Progomphus zephyrus* and *Scapanea archboldi*. Rosser W. Garrison, 1030 Fondale St., Azusa, CA. 91702-0821

**EXCHANGE:** Wanted specimens and collecting data from Malawi. I am trying to build as complete a list (with data) as possible to send along with specimens to Malawi Nat'l Museum. Will trade specimens from Malawi, Singapore, and northeast US. Allen E. Barlow, Jr., 411B Passaic St., Hackensack, NJ 07601.

**EXCHANGE:** I am extremely interested in all Odonata from New Guinea, Philippines, Malaysia, Taiwan, Japan & SE Asia generally. Am anxious to receive any specimens and literature (I have the seven-part Lieftinck series on PNG). In exchange I can offer many species from Trinidad (West Indies), eastern US (including NJ Pine Barrens), some Europe & Siberia. Will try to obtain anything physically possible to exchange with interested persons. John Michalski, 90 Western Avenue, Morristown, NJ 07960.

**EXCHANGE:** Want to exchange Odonata specimens and color slides. Offer specimens and slides of European Odonata, also slides on other subjects- birds, alpine plants, orchids, etc. Especially want exchanges with persons in countries such as Thailand, Sri Lanka, Madagascar, Mexico

and Venezuela. Henning Pedersen, Sct. Mogens Gade 56, 2.th., DK-8800 Viborg, DENMARK.

**WANTED:** Urgently need information concerning the existence and present location of the holotype female of *Neurocordulia clara* Muttkowski. I would also like to examine specimens of *Neurocordulia* from Alabama, Arkansas, Georgia, Louisiana, Mississippi, Tennessee, and Florida panhandle area, adults or larvae. Carl Cook, 469 Crailhope Road, Center, KY 42214.

**PERUVIAN RECORDS WANTED:** I am working on the preparation of a catalogue of the Peruvian Odonata to be titled "List and Distribution of the Dragonflies of Peru". I will be pleased to receive any information about collections made in Peru, holdings in museums, private collections, etc. Joachim Hoffmann, Universidad Nacional Mayor de San Marcos, Museo de Historia Natural, Av. Arenales 1256, Lima - 14, PERU.

**WANTED:** I am extremely interested in buying color-slides of all Odonata species (dragonflies & damselflies). I am interested only in slides mounted in Ready-Mounts (or similar type) NOT framed in glass! I want slides with species from all parts of the world. I expect high quality images. I will pay in advance on request. Please send your offer, indicating price wanted and number available to: Henning Pedersen, Sct. Mogens Gade 56, 2 Th., DK-8800 Viborg, DENMARK.

**FOR SALE:** The remaining stock of C.H. Kennedy and Mike Wright reprints. The UMMZ Insect Division is making these reprints available as sets of those publications still available. They are not complete sets of these authors' papers, however. We have about 20 sets of each, and when these are gone, that's it. We hope Odonatologists will take advantage of this one time offer.

Prices are as follows: Set 1- Kennedy Odonata Reprints \$6.00. Set 2- Kennedy non-Odonata Reprints \$5.00. Set 3- Wright Aquatic Insect Reprints \$4.00. For overseas orders, add \$5.00 per order for extra postage cost. Please make checks or money order payable to The University of Michigan. Send your orders to: Mark O'Brien, Insect Division - Museum of Zoology, The University of Michigan, Ann Arbor, MI 48109-1079

*"Dancing on gossamer wings,  
a living flash of light"*

Tennyson

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