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THE DRAGONFLY SOCIETY OF THE AMERICAS

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ARGIA, the quarterly news journal of the DSA, is devoted to non-technical papers and news items relating to nearly every aspect of the study of Odonata and the people who are interested in them. The editor especially welcomes reports of studies in progress, news of forthcoming meetings, commentaries on species, habitat conservation, noteworthy occurrences, personal news items, accounts of meetings and collecting trips, and reviews of technical and non-technical publications. Articles for publication in ARGIA should preferably be submitted as hard copy and (if over 500 words) also on floppy disk (3.5" or 5.25"). The editor prefers MS DOS based files, preferably written in WORD, WORD for WINDOWS, WordPerfect, or WordStar. Macintosh WORD disks can be handled. All files should be submitted unformatted and without paragraph indents. Each submission should be accompanied by a text (=ASCII) file. Other languages should be submitted only as text (=ASCII) files. Line drawings are acceptable as illustrations.

T. Donnelly (address below) is the interim editor of ARGIA.

BULLETIN OF AMERICAN ODONATOLOGY is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The BAO publishes taxonomic studies but will not consider the publication of new names at any taxonomic level. Enquiries and submission of manuscripts should be made to BAO editor T. Donnelly, 2091 Partridge Lane, Binghamton NY 13903. Final submissions (after review) should be made on floppy disk, as above, with illustrations in final form and preferably adjusted to final size.

MEMBERSHIP IN THE DRAGONFLY SOCIETY OF THE AMERICAS

Membership in the **DSA** is open to any person in any country. Dues for individuals in the US, Canada, or Latin America are \$15 for regular membership and \$20 for institutions or contributing membership, payable annually on or before 1 March of membership year. Dues for members in the Old World are \$25.

Dues should be mailed to Jerrell Daigle, 2067 Little River Road, TALLAHASSEE FL 32311

The **BULLETIN OF AMERICAN ODONATOLOGY** is available by a separate subscription at \$15 for members and \$18.75 for non-members and institutions.

Cover: Cora terminalis, Bolivia. This is the sort of bug that has Daigle, Tennessen, and friends returning to South America. Photo by Steve Valley

ARGIA - The News Journal of the D.S.A.

In This Issue.

Mother Nature is teasing us, as she always does at this time of the year. One day the temperature is in the 60's and flocks of Canada and Snow geese pour overhead. The next day the snow returns and summer seems impossibly far away. But we know it will come, and we are already preparing for all those wonderful field trips, in a world populated by whirring wings and glinting bodies — a world that seems very far away right now.

There are more field gatherings than ever before. The season starts with the Arkansas meeting in the middle of May, and the Dragonfly Days in south Texas that same weekend, and proceed to the Annual meeting in June, followed swiftly by the Michigan meeting in early July and the Tug Hill NY meeting in mid July. We will have a busy schedule. The annual meeting in West Virginia will feature the unusual combination of a very attractive venue in a poorly known state. Be there!

In late May there will be another Paul Brunelle seminar in Maine. These have been very popular in the past.

Fred Sibley reports on eastern strays of *Sympetrum* corruptum. This is one of our more interesting stray odonates, with numerous reports in the east. I know of no breeding populations east of Michigan, but strays are numerous. Most are found near the ocean, suggesting that they wander east and only stop when they see the surf.

Fred also reports on finding two teneral male Leptobasis damselflies in the Yale collection. Of unknown origin, he suggests that they may have come into the US as larvae on imported aquatic plants. I am reminded of Christiansen's 1946 report in Psyche of Andinagrion peterseni at Beltsville, Maryland. Christiansen decided that this insect was introduced on tropical plants also, and the locality near the huge Department of Agriculture complex seems consistent with this. Long ago Hagen, in his famous 1861 work, described Oxvagrion rufulum (a close relative of peterseni) from Northern California. It boggles the mind that aquatic plants might have been imported to San Francisco at the time the town was filled with raucous forty-niner gold miners, and we have always regarded this as a mis-labeled specimen (There were other mis-labelings in Hagen's work.) More recently Bob Honig found Protoneura cara in an aquatic garden in Houston and concluded that this, too, was a stray. Here the distance is only a

few hundreds of miles, but his conclusion seems sound. The point is well made. The little buggers are invading our shores. Is anything safe these days?

John Abbott and Robert Larsen report two new species for Nevada. That superbly dry state is finally getting a fairly respectable list of Odonata. Jim Johnson reports on an old specimen of Gomphus lynnae from eastern Oregon - right smack where he found it decades later. There are indeed good things hidden in insect collections, where they often gather dust (we hope not) for years after being collected. Remember Kelly Miller finding the Tanypteryx hageni from south of Bozeman, Montana in the Montata State University collection? The problem is that this one might not have been correctly labeled. If you have a few hours on a rainy day, why no go over some university's collection? You might be surprised. I did so recently at Cornell and managed to remove an old record of Enallagma doubledayi from a New York county. Sometimes negative knowledge is good too.

Jerrell Daigle once again provides us with a mouth-watering account of the latest Bolivia trip. These glorious accounts make you want to get on the next plane. I broke new editorial ground with this story. Generally I do a "global find-and-replace" to change his exclamation points with periods. But that just doesn't sound like our Jerrell. This time I just left them all in!

Fred Sibley gives us another account of his dragonfly observations in the British Virgin Islands. He has taken a less interesting part of the dragonfly world and made it very interesting. (How many species do you anticipate finding on semi-arid oceanic islands anyway?) He not only finds dragonflies, but finds the species mix different from year to year. His last article finally nudged me to put down on paper my own observations that are nearly a half century old from St. Thomas and St. John, the American part of the archipelago. Neither Fred nor I are holding out any great promise, but if you should happen to visit, then take a net anyway. Who knows what will be in residence when you do?

Fred and Dennis Paulson also add some range extensions for the Caribbean part of the world – *Micrathyria debilis* in Jamaica and *Telebasis demerarum* in Trinidad.

Bob Behrstock contributes an unusual article - a compilation of late occurrence records for Texas odonates. Most people simply let the end of the season drift past, but Bob is interested in how long these species last. Oddly enough, I received the article from Bob shortly after returning from a Christmas trip to Austin - where I observed several of these late occurrences first hand. The one that has always interested me is Hetaerina titia (flying around Austin the day after Christmas), which Bob does not include. Both early in the season (April and May) and late (November and December) Texas specimens have wings with only red color at the bases. But in the mid season their wings are No one has ever documented largely black. whether the same individual changes wing color, or whether the populations change. So many problems, so little time!

Sid Dunkle contributes a fascinating observation about a European falcon catching dragonflies. I have added my own observation of a Guatemalan falcon also catching dragonflies — but in an entirely different way. Just how many ways are there of catching dragonflies?

Bill Mauffray summarizes the recent activity in Georgia and provides with a URL for their attractive website.

I am happy that at least someone is using the address list that I sent out in the last issue. It was misprinted, as four readers let me know. The printer has supplied replacements, which I include with this issue.

Few Odonata people outside of the Northwestern crowd knew William Ricker, of Nanaimo BC, who died last fall. He was a towering presence in fisheries biology and a friend of dragonflies also. I have taken a few notes from his obituary which was written by Rob Canning.

Being an editor definitely has its moments. Sometimes people send you news items with no explanation or context. One included the following text: "The sight of Ed Vosberg pitching with a large dragonfly on his cap in those critical eighth-inning moments was absolutely hilarious. If you missed it, don't worry. You'll see it time and time again on blooper videos for years to come..." This has something to do with the Phillies baseball team. Anyone out there got a clue?

2002 SE MEETING IN FLORIDA 29-31 March

Jerrell J. Daigle, jdaigle@nettally.com, tel. 850-878-8787

It may be too late for you to plan on the Eglin Air Force Base meeting, but if you are around, perhaps

you could drop in. The meeting motel is the Friendly Inn at Niceville (904/678-4164).

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DRAGONFLY DAYS; WESLACO TEXAS 17-18 MAY 2002

The third Dragonfly Days will be held in the Rio Grande Valley on 17-18 May this year at the Valley Nature Center. The event has been very popular in the past. The featured speaker is Jackie Sones.

The URL for this event is http://www.valleynaturecenter.org/dragonflydays.ht ml.

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MIDSOUTH ODONATA MEETING, 16-19 MAY 2002

George L. Harp, Dept. of Biol. Sciences, P.O. Box 599 Arkansas State University, State University, AR 72467 Ph.: 870 972-3082, FAX: 870 972-2638, glharp@mail.astate.edu

A complete announcement was in the previous issue of ARGIA.

Glenwood, AR, will be our location for the meeting.

Accommodations:

RIVERWOOD INN (870 356-4567) Single (\$47), double (\$55) (nice)

Ouachita Mtn. Inn (870 356-3737) Single (\$47), double (\$47) (nice)

Lux Motel (870 356-3151) Single (\$36) double (\$42) (remodeled; okay; has a great breakfast restaurant)

If you are interested in this meeting, please contact George Harp.

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DSA MEETING IN WEST VIRGINIA, 20 – 23 JUNE 2002

The West Virginia meeting is fast approaching. The meeting itself is 20 - 23 June, 2002, at Lewisburg WV. Post meeting field trips to Elkins on 23-28 June and the Ohio River at Point Pleasant on 26-28 June will provide an exciting introduction to the Odonates of this beautiful but understudied state. The main meeting will be close to the Greenbriar Rivers and tributaries, and also to Cranberry Glades, one of West Virginia's famous high-altitude sites. At Elkins there are additional high-altitude sites such as Dolly Sods. The Point Pleasant trip will visit Greenbottom Swamp, a large wetland in the floodplain of the Ohio River.

Perhaps some of the *Neurocordulia molesta* that occur just across the river in Ohio will be found on the West Virginia side!

The web site for the meeting is http://www.dnr.state.wv.us/wvwildlife/nongame/20 02_dragonfly_society_meeting.htm
Jennifer Wykle, who is organizing the meeting, can be reached at jwykle@mail.dnr.state.wv.us

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2002 GREAT LAKES ODONATA MEETING – 1 – 4 JULY 2002

Mark O'Brien

A complete announcement was in the previous issue of ARGIA.

Meeting place: Roscommon MI.

For more information or to be put on the mailing list for a registration form, contact Mark O'Brien via email at: mfobrien@umich.edu or call 734-647-2199. You can also send mail to Mark at: Insect Division, Museum of Zoology, University of Michigan, Ann Arbor, MI 48109-1079.

Additional updates on the meeting will be available on the web at:

http://insects.ummz.lsa.umich.edu/GLOM2002/

NORTHEASTERN DSA MEETING IN TUG HILL PLATEAU, NEW YORK, 12 – 14 JULY 2002

An announcement was in the previous issue of ARGIA.

Meeting place; Watertown NY.

The group will meet Thursday evening 11 July in Watertown. The meeting motel will be the Watertown Econolodge (1-315-782-5500 or 1-800-553-2666). The rates are \$45 single, \$55 double with queen-size bed, and \$60 with two double beds.

Contact Nick Donnelly, tdonnel@binghamton.edu; 607-722-4939 for further details

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2002 ODONATE SEMINARS AT THE HUMBOLDT INSTITUTE ON THE COAST OF MAINE

"Larval and Adult Dragonflies and Damselflies: Systematics and Biomonitoring", by Paul Brunelle, May 26 - June 1.

This seminar will give an introduction to the order Odonata, its basic lifestages, morphology, behavior, and temporal and geographical distribution in the region. Current regulations, references, and sampling techniques will be reviewed. Larvae and adults will be sampled for taxonomic study and rearing. Reference specimens of larvae and adults will be available for comparative study. Determination to species using morphology and appearance will be the emphasis of lab work, with consideration given to preservation and recordkeeping methods. Paul-Michael Brunelle has been studying Odonata of the Atlantic Provinces of Canada and northern New England for the last ten years and recently published with respect to their distribution in that area. He has been retained by the Maine Department of Inland Fisheries and Wildlife to plan the Maine Damselfly and Dragonfly Survey (MDDS), a 5-year survey which began in 1999. He has been retained by Parks Canada to study the order in the Cape Breton Highlands and has received a grant from the Themadel Foundation to study the behavior of Neurocordulia michaeli, recently discovered in New Brunswick as well as grants from the Nova Scotia Museum and the New Brunswick Museum. He is the founder of the Atlantic Dragonfly Inventory Program (ADIP).

For information contact Brunelle at as849@chebucto.ns.ca

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CONNECTICUT RECORDS OF SYMPETRUM CORRUPTUM AND SOUTH AMERICAN COENAGRIONIDS

Fred C. Sibley, 2325 Co. Rd. 6, Alpine, NY 14805

Two Connecticut *Sympetrum corruptum* specimens and two *Leptobasis* (?) specimens were discovered in the process of sorting the Yale Odonate collection and are reported on here.

Sympetrum corruptum is a rare late summer and fall vagrant to the New England States (Blair Nikula, Argia 1998 10:(3)20) with only one (1906) record from Connecticut (Wagner and Thomas, 1999, The odonate fauna of Connecticut, Bull. Am. Odonatology vol 5 (4)). Yale specimen ENT.145456 (male) was collected by Philip Brylski, October 22, 1979 in Litchfield County, 1 mile south of Killingworth at Kroopa Pond. Yale specimen ENT. 145458 (M) was collected by Jeff Spendelow and Fred Sibley, July 12, 1980 in New Haven County on Faulkner's Island.

Faulkner's Island is about 4 miles off the Connecticut coast south of Madison. There is a lot of brushy vegetation but no fresh water on the island. This island has been a good place to sample

movement of land birds outside the normal migration period, since few species nest on the island and anything else is migrating or wandering. The birds arrive in small waves with none on most days. Presumably the dragonflies do the same thing. Monitoring dragonfly arrivals on this and similar islands might produce interesting records.

One Celithemis elisa and two Pachydiplax longipennis were collected the same day as the Sympetrum. Other odonates recorded on the island in 1980: Libellula semifasciata (June 3), Epiaeschna heros and Libellula pulchella (June 21), Enallagma civile (July 26).

Two teneral male Coenagrionids, obviously not one of the North American genera, were tentatively identified as *Leptobasis*, a South American genus. Both were collected by S. A. Hessel in Litchfield County: Yale specimen ENT.151809, on June 28, 1967 at New Milford, CT; Yale specimen ENT.154748, on May 27, 1968 at Washington, CT.

There is no label information indicating the specimens were not wild caught, but one would assume they came in with shipments of tropical flowers and were given to Mr. Hessel, a well known entomologist in Litchfield County.

TWO NEW DAMSELFLIES FOR NEVADA

John C. Abbott and Robert R. Larsen

Recently, Robert Larsen made a trip to southeastern Nevada where he made a collection of damselflies. Robert collected along the Virgin River just north of the Bunkerville Bridge in the town of Mesquite. In this collection, there were two species previously not reported from Nevada: *Hetaerina vulnerata* and *Ischnura demorsa*. The collection date, March 18, 2001, represents a significant new early date for both of these species. The dates previously reported by Westfall and May (2000) were June 13 for *H. vulnerata* and May 26 for *I. demorsa*.

These records represent a western range extension within the U.S. for *I. demorsa* and a more complete understanding of the range of H. *vulnerata*, which is known from both California and Arizona.

The *Hetaerina vulnerata* were taken at a shallow rocky-bottomed portion of the Virgin River with riffles, cut banks and overhanging vegetation. The *Ischnura demorsa* were taken where a small stream enters the River. Riparian vegetation in the area included Water Cress, Cat-tail and Spike Rush. At both localities the elevation was approximately 570 meters. Additional species collected at these localities were *I. denticollis* and *Argia vivida*. Specimens of *H. vulnerata* have also been taken in

New Mexico on October 18 and October 19 in Luna and Grant Counties, respectively. This extends the published late date (Westfall and May 1996) for this species nearly two months.

Reference:

Westfall, M. J., Jr. and M. L. May. 1996. Damselflies of North America. Scientific Publishers. Gainesville, FL.

A NEAT DISCOVERY

Jim Johnson

In 1999, I had the opportunity to browse through the Oregon State University entomology collection for a short time before an Oregon Entomological Society meeting was to start. I had never looked through any university insect collection before, so I was quite curious. I had just begun to go through the odonate drawers when Steve Valley and Eric Coombs showed up. They had been working on the specimens for some time, cataloging them and verifying their identification. I was shown a number of interesting specimens that they had come across including a fantastic male *Phenes raptor* recently collected in Chile.

We opened a drawer of specimens that Steve and Eric had not yet cataloged, when I spotted an unidentified female gomphid which was clearly a *Gomphus lynnae*. This species, described by Dennis Paulson relatively recently in 1983 after its discovery on the Yakima River, Washington, in 1971, is currently known from only two additional drainages in the Pacific Northwest - the John Day and Owyhee Rivers in Oregon. It was only recently found on the Owyhee River by me in 1998.

An "old" specimen of *Gomphus lynnae* in the OSU collection was intriguing. According to the specimen's tag it was collected by R.W. Lauderdale on the Owyhee River at the town of Rome - the same location where I found them. What is more interesting, however, is that it was collected on 26 June 1952 - 19 years before the species was "discovered" on the Yakima River, and 46 years before it was known to occur in the Owyhee River basin by modern odonatists. It seems likely that R.W. Lauderdale was after other insects when he collected an unfamiliar odonate which was later forgotten in a university collection drawer.

I have to wonder how many other interesting specimens lie waiting to be discovered in forgotten collection drawers. You never know what you might find - even when you're not in the field.

A FISTFUL OF BOLIVIANOS!

Jerrell J. Daigle, jdaigle@nettally.com

Back to Bolivia! That was the rebel yell by Ken Tennessen and Steve Valley. Jim Johnson and I quickly joined them for a November trip. This time we brought lots of dollars and Bolivianos with us. (See **ARGIA** 12:1, April 2000).

We arrived in Santa Cruz on time despite several attempts by US airport security to delay us. We met Lic. Julieta Ledezma at the Museum and one of our favorite odonatology students, Ingrid Vaca Gonzalez, who would accompany us on this expedition. The next day, we headed out for Villa Tunari where we stayed most of the trip.

Our favorite B & B hotel (some advice: don't go to any motels in Bolivia, as we found that the term "motel" has quite a different, actually risqué, meaning here) was the Hotel Araras with its macaws, parfots, toucans, and spider monkeys at our doorsteps! Despite almost constantly cloudy and rainy weather, plus a few blockades on the side roads by the campesinos who grow the coca and an extensive military presence, we had a fantastically fun time! The food was great, especially the surubi catfish cooked in coconut milk! We sipped Paceña beer (of course for medicinal purposes) as we made the scene in our terrific commemorative Bolivia T-shirts, courtesy of Steve Valley. Thanks, Steve!

We collected many exciting species of Odonates! Just east of Tunari, at a small stream next to the main highway, we got such gomphids as Archaegomphus nr. furcatus, Progomphus boliviensis, Phyllocycla anduzei, and Phyllogomphoides lieftincki. We collected over 35 species at this one small stream. This is Jim Johnson's favorite place.... ask him about the local water pipes and their structural soundness!

Here and nearby, we got libellulids like Dasythemis esmeralda, Micrathyria artemis, and Misagria parana. Some aeshnids collected were Coryphaeschna perrensi and a gigantic Staurophlebia. Among the more notable damselflies, we got Acanthagrion abunae, A. jessei, Argia hamulata, Epipleoneura spps., Heteragrion inca, Lestes dichrostigma, L. falcifer, Mnesarete devillei, Palaemnema clementia, Protoneura amatoria, and Telebasis sanguinalis.

At a nearby lake, we got a new species of shadeloving *Metaleptobasis* under memorable but difficult collecting conditions. This green and redeyed, yellow damselfly hid in the dense tangled shrubbery at the west end of the lake. Almost every small tree or vine I brushed against or touched with my net was home to vicious, stinging arboreal orange ants. Yea, they enjoyed tormenting me to the breaking point but I persevered, all for the sake of science and nature. As the song goes, " She blinded me with science!"

West of Villa Tunari in the montane rainforest, we found interesting odonates such as Progomphus occidentalis, the pruinose white Macrothemis mortoni. the giant Libellula herculea. Gomphomacromia spps., Acanthagrion vidua, Argia nigrior, Cora irene, Philogenia buenavista, Polythore boliviana, and "Teinopodagrion" setigerum. Ken and Steve took us to their favorite site and we saw the unbelievable Cora terminalis with its metallic blue wings. The color was only visible from certain angles, otherwise the wings looked transparent. They shimmered like strobe lights during its territorial clashes and courtship displays over the seepage stream. It was well worth the price of admission to Bolivia!

We did take a day off to drive west to the dry, potato growing country around Cochabamba. We didn't do much collecting and nothing much happened except four dogs chased me during a pit stop and one of them nipped me in the right calf. Fortunately, the MASH unit was on hand and Hawkeye (Steve Valley) and the others fixed me up. Thanks, Compadres!

Most days we experienced lots of rain, and we didn't get to see many odonates except a few things if we were willing to get wet. We did add some new species to the list that we didn't get before on previous trips. We found a new species of *Lestes* nr. apollinaris, Acanthagrion sp., that lake Metaleptobasis, and Micrathyria sp. Undoubtedly many more discoveries await travelers to Bolivia. One good thing I noticed was the unbroken expanse of montane rainforest west of Villa Tunari, unlike the patchwork of the eastern Andes in Ecuador caused by landslides and clear-cutting. Hopefully, Bolivia will continue to protect its virgin rainforests.

All in all, it was a great trip! We even had bolivianos left over! Yes, we are ready to go back! Doborochi!

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MISCELLANEOUS NOTES ON BRITISH VIRGIN ISLAND DRAGONFLIES

Fred C. Sibley, 2325 Co. Rd. 6, Alpine, NY 14805 607-594-4179 or 594-3584 <fcsibley@empacc.net >

This is the third note on the October odonate fauna of the British Virgin Islands (BVI): (ARGIA 1999, 11:(1)16-16-19; 2000, 12 (1):18-19). The changes

from 1997 to present are difficult to interpret because there are no earlier studies. This note adds three species to the BVI.

My five visits to the BVI have all been in October, 1997-2001, so reference to these years in the text means October.

Species and site notes

Lestes forficula - New species for BVI. First collected in September 1990 by David Smith at The Slob on Anegada Island (specimen in IORI collection). It was found to be quite common in a stock pond on Ridge Road, Tortola in 2000 and 2001 but was not found in either year on Anegada despite serious searching.

Brachymesia furcata - First seen at Botanical Garden, Tortola in 1999, absent in 2000 but a few present in 2001.

Brachymesia herbida - At Botanical Garden, Tortola since 1999 and in 2001 also collected on Guana Island and at stock pond on Ridge Road, Tortola in 2001 (single individuals). In addition a large population was present in the ditch ponds around the Beef Island Airport.

Erythemis simplicicollis - CORRECTION - 2000 ARGIA article should read Erythemis vesiculosa.

Erythrodiplax berenice - New species for BVI. Collected in September 1990 on Anegada by David Smith (IORI collection). Refound there in 2000 and 2001 as well as on Tortola and Beef Island. The most abundant odonate in the islands with incredible densities around the salt pond and mangroves on Anegada Island and lesser numbers in similar habitat on Tortola and Beef Island.

Erythrodiplax umbrata - A common species on Tortola, Guana and Beef Islands but very rare on Anegada. One individual seen there in 2000.

Micrathyria dissocians - New species for BVI. Common in stock pond on Ridge Road in 2000 and 2001.

Anegada island is the only flat coral island in the country. It has a large central salt pond and three freshwater slobs. Two are mostly filled with trees and the third, The Slob, has been bulldozed out to leave a pond in the middle of bare coral. In 2000 all three had *Orthemis ferruginea*, *Ischnura ramburii* and *Tramea abdominalis* with the more open pond having larger numbers. Only two *Pantala flavescens* and one *Erythrodiplax umbrata* were found in a day and a half on the island. 2001 was much drier and all three ponds had shrunk in size

and depth. *Erythrodiplax umbrata* was not present and *Ischnura ramburii* was scarce.

Tortola: Three ponds were checked on Ridge Road in 2000. Two had the standard species while the last, about 60x30 feet, also contained *Lestes forficula*, *Micrathyria dissocians*, *Perithemis domitia*, and in 2001 *Brachymesia herbida*. This third pond differs in having dense aquatic growth including water hyacinth.

Rate of immigration

Most if not all the odonates on Guana Island are from other islands. The major freshwater pool is unsuitable for larval growth. The other pools hold only a few larvae, frequently dry up, and the only emerging larvae we have seen was killed by one of the abundant anolis lizards. The island is thus a good site to study immigration. *Erythrodiplax umbrata*, *Orthemis ferruginea* and *Tramea abdominalis* are all common on Beef and Tortola Islands, only a mile or so from Guana.

In 2000 and 2001 we tried to estimate populations and immigration rates of these three species on Guana Island. Using a modified mist net held horizontally over the pond it was possible to capture most of the individuals in a relatively short time.

In 2000 we captured dragonflies on only a few days, marked individuals and either returned them to pond or removed them to another island. A few marked *Orthemis* and *Tramea* were still present 10 days later but most (20 plus marked) were not found again. Marked *Erythrodiplax* individuals (12) taken to Beef Island did not return. Maximum populations were about the same on the first and last days of trapping: *Erythrodiplax* 12; *Orthemis* 20: *Tramea* 2.

In 2001 we tried to capture every individual present each day and remove them to another island. The maximum numbers were vastly different from 2000 (Erythrodiplax 3; Orthemis 3; and Tramea 3). In 5 days we caught 10 Tramea, 7 Orthemis and 7 Erythrodiplax with numbers declining so there was only 1 Tramea found the last day, an immigration rate of about 1 individual per species per day. After a 4 day break numbers had recovered to first day levels. After another 4 day break, due to bad weather, we made a visual estimate (floating debris in a pond 300 times as large as the original 5x2 foot pool precluded using mist net) of at least 10 Tramea, 10 Orthemis and 5 Erythrodiplax.

In both years, when we removed the adult male *Erythrodiplax* they were replaced by subadult males. In 2000 removal of *Orthemis*, almost all "purple", resulted in a replacement population of

mainly "red" individuals. Populations in both years were approximately 2-3 times the number of occupied territories (except see *Tramea* under establishment of new species).

Conclusions: Individuals of all three species wander randomly from other islands searching for new habitat and land on Guana. These are primarily subadult individuals who move on if habitat is not available, or stay and mature if habitat is available. A larger pond size, as in 2000 and the last day of our stay in 2001, attracts and hold more individuals. Immigration rates also must be dependent on size of source populations. Drier conditions in September of 2001 presumably produced a lower immigration rate than in 2000.

Establishment of New Species

In 1997 huge numbers of *Tramea calverti* invaded Guana Island and Anegada Island. This species has not been recorded since.

In 1997 huge numbers of *Pantala hymenaea* invaded Guana Island but not Anegada. This species has not been seen since.

The failure of these two species to establish populations is difficult to explain. Certainly Tortola and Anegada presented suitable breeding pools although Guana did not.

In 1997 huge numbers of *Tramea abdominalis* invaded Guana Island but not Anegada. It was not seen on Guana Island in 1998 but has been increasingly common since. On Tortola, not checked until 1999, it has also increased in abundance and on Anegada was common in 2000 and 2001. This species was probably already established on Tortola, but its absence from Anegada in 1997 and subsequent abundance in 2000 and 2001 leaves the question open. It was definitely absent from Guana in 1998 but has increased its population each year since. Is this due to new populations on Tortola and Beef Island or an explosion of those populations following a series of wet years?

Brachymesia herbida was first recorded from Tortola in 1999 and since it was at a permanent water source of long standing was assumed to have always been present there. The appearance of the species in 2001 on Guana Island and at a pond on Tortola where it was absent in 2000 plus the establishment of a large population on Beef Island again presents the choice of explosion with series of wet years or recent invasion.

The absence of *Lestes forficula* on Anegada although present in 1990 would suggest that there is

regular extinction and reestablishment of populations in the BVI.

Acknowledgements

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ODONATA OF ST. THOMAS AND ST. JOHN, VIRGIN ISLANDS

Nick Donnelly

I had not envisioned writing an account of the relatively meager Odonata fauna of the northern US Virgin Islands, but Fred Sibley's excellent articles on the nearby British islands have made me realize that there is interest in this area. I spent about six months on these islands in 1956 and 1957 while carrying out a geological mapping project. The islands are thorn scrub and semi-arid in most part, with only small remnants of original forest. They have very few attractive fresh-water habitats, mainly streams ("guts") with low flow and stockponds, which generally had unvegetated shorelines. On most days I went into the field without a net. This can be a big mistake, as I found several times.

St. Thomas is one of the original localities listed by Hagen (1861) for two of his newly described species: Agrion (=Enallagma) coecum and Diplax (=Erythemis) credula. There are some problems with both of these, and they are discussed below.

I also list some Odonata found in the vicinity of Cruz Bay, St. John, by Whitehouse (1939). These were from small streams whose names had disappeared by the time of my visit 18 years later. I include also some species reported by Klots (1932) from both the US and British Virgin Islands.

In my several return visits (up to 2000). I have seen the few aquatic habitats degraded further with sprawling development, as the rich have purchased and fenced off tracts containing access to the few "guts" that have fresh water most of the year. Stockponds have largely disappeared, as the economy has become almost entirely tourist development in the subsequent decades. Turpentine Run, between Donoe and Mt. Zion in the east central part of St Thomas, is a low-gradient

but highly impacted stream that might warrant an inspection by visiting Odonatists. Dorothea Gut, in northwestern St. Thomas, is a tiny, steep rocky stream with pools of water and small waterfalls dropping about a thousand feet to the sea.

St. John has fared much better, but there were fewer aquatic habitats on that island. The most interesting locality that I found is a spring in bedrock at L'Esperance, not far from the Centerline Road. Some typical stockpond Odonata were also found at Bethany, in Guinea Gut.

Species:

Lestes forficula. A common stockpond species

Protoneura viridescens. I found a mated pair on 28 August 1956 along Turpentine Run, which was fairly open and heavily impacted by agriculture. I went home for a net and returned about an hour later to catch the pair, which had been ovipositing in moss on rocks in the stream. I found it in numbers in the spring at L'Esperance in St. John in June of 1961. These specimens were included in the type series of this species, which Westfall had determined by this time was not conspecific with capillaris.

Whitehouse (1939) reported this (as *capillaris*) from "Envy Gut", near Cruz Bay, St. John.

Enallagma civile. An uncommon species on stockponds.

Enallagma coecum. Widely distributed in streams in scrub forest, although never abundant.

The localites (Hagen, 1861) of this widespread and variable species were given by Hagen as St. Thomas and Cuba. The St. Thomas specimen in the MCZ has evidently been designated as lectotype, but this designation has not been published. The species is also reported by Whitehouse (1939) from St. John.

Ischnura ramburi credula. Not common but widespread on small ponds. Reported by Whitehouse (1939) from St. John.

Telebasis dominicanum. Common on Turpentine Run.

Anax junius. Reported from St. Thomas and St. John by Klots (1932), but not seen by me.

Brachymesia herbida. On a few ponds; not common.

Dythemis rufinervis. Turpentine Run; L'Esperance. Widespread but not abundant anywhere. Also reported by Klots (1932) and Whitehouse (1939) from St. John

Erythemis credula. The type series included two specimens, from St. Thomas, and Minas Gerais, Brazil (Hagen, 1861). The Brazil specimen is a

complete male; the St. Thomas specimen is a female lacking the abdomen. *Credula* is South American and is unknown from the Antilles (except for reports of larvae from Antigua and Barbados (Calvert, 1928), both of which were queried by the author and seem to me to be erroneous.) Its valid occurrence on St. Thomas is doubtful.

Erythemis vesiculosa. Common on Turpentine Run. Also reported by Klots (1932) from St. Thomas and St. John, and by Whitehouse (1939) from St. John.

Erythrodiplax berenice naeva. Locally common in saline pools on the mainland behind mangroves.

Also reported by Klots (1932) from St. Thomas.

Erythrodiplax jusiniana. Reported by Klots (1932) from St. Thomas. This was not found by me, but it is common on Puerto Rico and could well have occurred on St. Thomas.

Erythrodiplax umbrata. Fairly common on stockponds.

Also reported by Klots (1932) from St. Thomas and St. John and by Whitehouse (1939) from St. John.

Macrothemis celeno. On Lovenlund Creek, St. Thomas, and L'Esperance. Not common.

Also reported by Klots (1932) from St. Thomas and St. John and by Whitehouse (1939) from St. John.

Orthemis "ferruginea". Fairly common in Turpentine run and at scattered stockponds. The quotations on the name indicate that this is not in my estimation true ferruginea but a widespread Antillean species which is still unnamed. Most of the specimens seen and taken were of the purple phase, but I have seen the bright red phase near the airport on St. Thomas. Fred Sibley has collected numerous specimens of both color phases in the British Virgin Islands.

Also reported by Klots (1932) from St. Thomas, St. John, Tortola, and Virgin Gorda, and by Whitehouse (1939) from St. John.

Pantala flavescens. Scarce.

Also reported by Klots from St. Thomas and by Whitehouse (1939) from St. John.

Pantala hymenaea. Reported by Whitehouse (1939) from St. John.

Perithemis domitia. In shaded pools along Turpentine Run, and also at L'Esperance.

Reported by Whitehouse (1939) from St. John.

Tramea abdominalis. Widespread; generally on roads or hilltops.

Also reported by Klots (1932) from St. Thomas and by Whitehouse (1939) from St. John.

Tramea onusta. I saw a lone individual flying in a swarm of abdominalis on a hill top on my first day in the field in St. Thomas. Having no net, I hit it with a machete and confirmed the identification, but discarded the mangled specimen. I never saw another.

Also reported by Klots (1932) from St. Thomas and St. John.

Calvert, P.P., (1928), Report on Odonata, including notes on some internal organs of the larvae collected by the Barbados – Antigua Expedition from the University of Iowa in 1918. Studies of Natural History. Iowa University 12(2): 1-44, 5 pl.

Hagen, H.A., 1861, Synopsis of the Neuroptera of North America, with a list of the South American species. Prepared for the Smithsonian Institution. Smithsonian Miscellaneous Collections, 4: 347 p. [Odonata from 55-187]

Klots, E.B., 1932, Odonata or Dragonflies. Vol. 14, pt. 1 of Insects of Porto Rico and the Virgin Islands. Scienific Survey of Porto Rico and the Virgin Islands. New York Academy of Sciences, 107 p, 7 pl.

Whitehouse, F.C., 1939, Notes on some tropical Dragonflies. Canadian Entomologist, 71: 199-202

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MICRATHYRIA DEBILIS FROM JAMAICA

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Micrathyria debilis is found from Mexico south to Guatemala and in the Caribbean on the island of Cuba [Dragonflies of North America, Needham, Westfall and May, 2000].

During continued curation of the Yale Peabody Museum odonates a collection of Jamaican material was discovered. Most had been collected by W.G. Kloopt in 1967, but there was one specimen collected by P.F. Bellinger in 1956. All had been identified in 1973 by T. Crawford and the Bellinger specimen as Micrathyria debilis [Nick Donnelly rechecked the identification].

This is apparently the only record from Jamaica.

Specimen YPM.ENT.153745. female. Jamaica, Limeacre. Jan 2, 1956.

The record seems valid. P.F. Bellinger was in Jamaica at this time [C. Remington, pers. com] although the location of Limeacre is unknown. The Yale collection contains no Cuban or Central American odonate material so mixing of specimens is improbable. The Jamaican specimens were in glassine envelopes and seemingly in the same box as when identified by T. Crawford.

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Dennis Paulson

In a recent effort to identify South American coenagrionids in my collection, I discovered a male *Telebasis demerarum* (Williamson) from Trinidad, apparently the first record from this fairly well-known island (Michalski, 1988). I collected it in Nariva Co., slough at mile 46 on Manzanillo-Mayaro Road, 2 March 1984. The species was known from the Guianas, northern Venezuela, and northern Brazil (Bick and Bick, 1995) so was to be expected in Trinidad.

References:

Bick, G. H., and J. C. Bick. 1995. A review of the genus *Telebasis* with descriptions of eight new species. Odonatologica 24: 11-44

Michalski, J. 1988. A catalogue and guide to the dragonflies of Trinidad. Univ. West Indies, Zool. Dept., Occ. Pap. No. 6

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NEW LATE FLIGHT DATES FOR TEXAS ODONATA INCLUDING 20 LATE RECORDS FOR THE UNITED STATES

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INTRODUCTION: Flight periods for odonates of the southern U.S. were summarized by Westfall and May (1996), Dunkle (1989, 1990, 2000), Needham et al. (2000), and Abbott (2001). Updates for southern states are included in web sites such as Biggs (2001), and Mauffray (1999, 2000). Records from Texas were gleaned from both intensive and extensive collections that began in the late 1800s (reviewed in Abbott 2001). Nonetheless, the flight periods of many southern odonates remain imperfectly documented. Collecting bias, often associated with university vacation schedules, as well as dynamic factors such as habitat change, drought, and global warming trends cloud our understanding both of emergence disappearance of adults.

South Texas, subtropical, moderately warm in winter, and occupying a good bit of the southern margin of the U.S., represents an immense area in which to make discoveries concerning late flying odonates. Besides possessing many common, widespread species, a number of odonates with limited U.S. ranges occur along the Rio Grande, the state's 889-mile aquatic boundary with Mexico. Especially in the Lower Rio Grande Valley near the Gulf of Mexico, tropical genera such as Acanthagrion, Cannaphila, Dythemis,

Macrothemis, Micrathyria, Neoerythromma, Neoneura, and Phyllogomphoides have attracted many collectors, albeit usually during the more productive, warmer, mid-year months. Most recently, Eubanks et al. (2001) summarized the odonate fauna of the Lower Valley. Still, collecting effort remains uneven for both geographic and temporal coverage in the Lower Valley and the remainder of Texas; thus, the current understanding of both early and late flight dates may be overly conservative.

Based upon recent fieldwork, I summarize late Texas flight dates for 29 species, about one seventh of the 210 odonates recorded in the state (pers. comm. John Abbott). Twenty of these represent new late flight dates for the entire U.S. These data are presented with the hope that they will be of value to other workers tracking the long-term effects of temperature change on spatial and temporal distribution of aquatic invertebrates.

METHODS: Most records pertain to specimens that were selectively netted, placed in labeled envelopes, dehydrated in acetone, and air-dried (Dunkle 1989). The few photographic records were obtained with a tripod-mounted 35mm camera, 100 ISO film, 200mm macro lens and strobe. Slides were labeled with field note data taken during the photographic process. Records derived from slides are for easily recognized species only. Sight records of Anax walsinghami and Tramea insularis involved multiple individuals observed intermittently over 0.5 hours or more, and were made with the aid of close-focusing binoculars. Both were at or near previous collection sites. Specimens were identified by the author and confirmed by John C. Abbott (University of Texas, Austin), in whose care original or duplicate slides and all but three of the voucher specimens were The remaining specimens (Lestes disjunctus australis) were sent to Mark McPeek, Dartmouth College, for DNA extraction.

RESULTS: Twenty-nine new late Texas flight records are compared to previously published late dates for Texas and, if available, for the U.S. (Table 1). Several intermediate later dates are presented to establish trends. The records pertain to 14 zygoptera and 15 anisoptera. The twenty boldfaced dates are late records for the entire U.S. The large number of December fliers, contributing the bulk of the list, is noteworthy. Although a tropical origin has not been established for Enallagma, the six remaining zygopteran genera are tropical. Nine of the 14 species are coenagrionids, by far the largest zygopteran family in the U.S. and the world. Abbott (2001)lists five other December-flying coenagrionids (a sixth is extrapolated from its Mexican range), four of which I encountered during December 2001. Three families comprise the 15

Anisoptera listed: Aeshnidae and Gomphidae, each with one species of Middle American origin, and Libellulidae with 13 species in nine genera. Of the latter, only *Sympetrum* has its center of abundance in the northern latitudes; the remaining genera are tropical. Eight of the Libellulids were not recognized by Abbott (2001) as late fliers, doubling the number now known to fly in Texas during December.

DISCUSSION: Any consideration of late flying odonates is fraught with uncertainty: Is a January flying *Erythrodiplax minuscula* in Florida very late or very early? Is one flying in Texas during December enjoying a prolonged flight season because of favorable winter temperatures, or did it emerge late because of an especially cold or dry summer (Corbet 1999)? Still, the exercise is worth pursuing, as trends among observations peripheral to the norm can only be recognized when numbers of apparently isolated reports are assembled into a body of records. Multiple to numerous individuals are indicated for most species (Table 1), signifying definite flight season extensions, as opposed to single anomalous individuals.

Abbott (2001) lists 15 species--7% of the state fauna--flying in Texas during December. Combining the records from Table 1 yields a total of 34 species on the wing in December--16% of the state fauna. Because freezing temperatures often reach south Texas during late December and January (as they did in late December 2001), Abbott's figure of 16 January fliers will probably be minimally influenced by future collecting efforts.

The presence of three late-flying lestids may be noteworthy, although not wholly unexpected, as: (1) most Florida species are known to fly late in the year (Dunkle 1990), and (2) most lestids exhibit one generation per year overwintering as eggs (Corbet 1999), so late Texas breeders should be present in temporary pools filled by fall rains. In Houston (Harris County), Lestes disjunctus australis was flying 19 Dec, the same date on which I photographed it two years earlier. Abbott (2001) (in possession of mid-summer specimens) echoes the suggestion of others that southern populations of disjunctus may exhibit both spring and late fall emergences. In southern Texas, both L. alacer and L. forficula were common and flying more than two months later than published late Texas dates. Many reproductive pairs of each were noted.

The large proportion of coenagrionids and libellulids conforms to Corbet's life cycle data, if (1) odonate cycles in the subtropical Rio Grande Valley reflect those of organisms further south, and (2) multiple generations account for the Lower Valley's late fliers. Highest numbers of generations

per year are exhibited by tropical coenagrionids and libellulids that are capable of breeding and developing continuously ("facultatively multivoltine") within habitats that are always available for occupancy by larva (Corbet 1999). The various ponds, oxbow lakes, irrigation canals, and the Rio Grande itself all provide aquatic habitats that are available on a year-round basis.

What factors might account for so many occurrences that are weeks to months later than previously published dates? It is tempting to cite global warming as the cause of extended flight periods. Indeed, during the current 25-year warming trend documented by NOAA's National Climatic Data Center (2001), invertebrates such as odonates are being exposed to a global temperature increase of approximately 2.0°C/century. For the seven years prior to 2001, this translated to an average December temperature in the Lower Rio Grande Valley (Brownsville, Cameron County) of 21.88° C (71.2° F). Alternatively, the Climatic Data Center also documented moderate to severe drought conditions in the Lower Valley during much of 2000 and 2001, and the presence of large numbers of Lestes, and Micrathyria may reflect delayed emergence from temporary pools receiving water late in the year.

Paulson (2001) offered persuasive evidence for global warming-induced changes (e.g., northwardextended ranges and prolonged flight dates) for south Florida's winter odonates. His brief January 2000 survey yielded 42 species of odonates flying in a region that produced only 9 January species during the early 1960s. Of those 42 species, six exhibited later flight dates than had been documented in the interim; two had established new U.S. populations, and two represented first and second records of tropical species for the U.S. Similarly, I documented northward expansion of several Neotropical odonates in east Texas (Behrstock 2000), apparently the result of a series of warmer winters with higher average and minimum temperatures. Such warmer winters may prolong feeding of larvae and enhance survival of their prey base, as well as increase the period during which adults can both feed and breed, culminating in increased survival at the northern periphery of a species' range.

An alternative explanation for the rash of late dates uncovered by this brief study is simply under-representation of southern Texas counties leading to collecting bias. The four southernmost counties of Texas (Cameron, Hidalgo, Starr, and Willacy) comprise only a bit less than 2% of the state. However, as indicated above, they are rich in tropical odonates that attract collectors, although rarely during winter. Currently; Abbott's odonate database at the University of Texas contains 5114

Texas records gleaned from collections across the country. Only 188 (3.7%) of these are from the Lower Rio Grande Valley, and (due partly to incomplete data entry) only a few of these are known to be winter captures (pers. comm. John Abbott). Thus, it is reasonable to say that winter odonates of the Lower Rio Grande Valley are under-represented in Texas collections.

I conclude that in all likelihood, a portion of these late records represents changes induced by warming trends. However, the importance of temperature increases in modifying the winter odonate fauna of Texas is masked by the paucity of late season collections in the Lower Rio Grande Valley and elsewhere throughout the state. The data presented here should establish a better baseline for future reference.

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References:

Abbott, J.C. 2001. Distribution of Dragonflies and Damselflies (Odonata) in Texas. Transactions of the American Entomological Society. 127(2): 199-228.

Behrstock, R.A. 2000. New records of Neotropical Odonates on the Upper Texas Coast with comments on recent temperature increases. Argia 12(1): 8-11.

Biggs, K. 2000. California Dragonflies & Damselflies. http://www.sonic.net/dragonfly/

Corbet, P.S. 1999. Dragonflies: Behavior and Ecology of Odonata. Ithaca: Cornell University Press.

Dunkle, S.W. 1989. Dragonflies of the Florida Peninsula, Bermuda and the Bahamas. Gainesville: Scientific Publishers.

Dunkle, S.W. 1990. Damselflies of Florida, Bermuda and the Bahamas. Gainesville: Scientific Publishers.

Table 1. New supporting data for latest Odonata flight dates in Texas and the U.S. Late U.S. dates are boldfaced. Abbreviations in Species column: (S) = specimen record, (P) = photo record, (V) = sight record.

Pagesphere (active) The (Abbert 2001) The (Abbert 2001) 24 Dec 2001 Start 25 Dec 2001 Constitution of Constitutio	SPECIES	LATEST PUBLISHED TEXAS AND U.S. FLIGHT DATES	LATE DATE	TEXAS COUNTY	NO. SEEN	HABITAT
17 Cet (TXV) (Westfall and May 1996)	Zygoptera					
1 Oct (TX) (Westfall and May 1996) 19 Des 2001 Harris 3-4	Hetaerina americana (S)	1 Dec (Abbott 2001)	28 Dec 2001	Starr	25+	Cane bed at Rio Grande edge
10 Dec 1909 Harris 3.4 10 Dec 2001 Harris 3.4 14 Oet (Abbort 2001) 15 Jan (FL) (Dunkle 1990) 19 Dec 2001 Hidalgo c. 16 23 Sep (Abbort 2001) 25 Oet (AR) (Westfall and May 1990) 12 Oet 2001 Hidalgo c. 16 25 Oet 2001 Hidalgo c. 16 25 Oet 2001 Hidalgo c. 16 26 Oet 2001 Hidalgo c. 16 27 Oet (Abbort 2001) 15 Now (FL) (Westfall and May 1996) 22 Dec 2001 Hidalgo 25+ 24 Oet (Abbort 2001) 15 Now (FL) (Westfall and May 1996) 25 Dec 2001 Hidalgo 25+ 25 Oet (Abbort 2001) 15 Now (FL) (Westfall and May 1996) 25 Dec 2001 Hidalgo 25+ 26 Oet (Abbort 2001) 24 Dec (FL) (Westfall and May 1996) 25 Dec 2001 Hidalgo 25+ 25 Sep (Abbort 2001) 24 Dec (FL) (Dunkle 1990) 13 Oet 2001 Hidalgo 20+ 25 Sep (Abbort 2001) 24 Dec (FL) (Dunkle 1990) 13 Oet 2001 Hidalgo 20+ 25 Sep (Abbort 2001) 24 Dec (FL) (Dunkle 1990) 15 Oet 2001 Hidalgo 25 Oet (Abbort 2001) 25 Sep	Lestes alacer (S)	17 Oct (TX) (Westfall and May 1996)	21 Dec 2001	Kenedy	c. 20	Grassy pool edge
19	L. disjunctus australis (S)	27 Nov (Abbott 2001); 15 Jan (FL) (Dunkle 1990)	19 Dec 1999	Harris	34	Grassy pool edge
2.3 Sep (Abbort 2001) 2.2 Sep (Abbort 2001) 2.3 Sep (Abbort 2001) 2.4 Sep (Abbort 2001) 2.5 Sep (Abbort 2001)	Same (S)		19 Dec 2001	Harris	34	Grassy pool edge
23 Sep (Abbort 2001) 2 Oct (Abbort 2001) 2 Oct (Abbort 2001) 2 Oct (Abbort 2001) 3 Oct (Abbort 2001) 3 Oct (Abbort 2001) 3 Oct (Abbort 2001) 3 Oct (Abbort 2001) 4 Oct (Abbort 2001) 5 Oct 2001	L. forficula (S)	14 Oct (Abbott 2001)	26 Dec 2001	Hidalgo	c. 6	Grassy pool edge
2 20ct (Abbort 2001) 2.5 Oct (Abbort 2001) 1.5 Oct (Abbort 2001) 2.5 Oct (Abbort 2001) 2	Same (S)		29 Dec 2001	Cameron	+08	Lake edge, woodland understory
2 Cet (Abbort 2001); 25 Oct (AB) (Westfall and May 1996) 28 Dec 2001 Hidalgo I and 11 and 1 Aov (Abbort 2001); 15 Nov (TL) (Westfall and May 1996) 29 Dec 2001 Hidalgo 25+ SO Cet (Abbort 2001); All year (FL) (Westfall and May 1996) 20 Dec 2001 Hidalgo 25+ SO Cet (Abbort 2001); All year (FL) (Westfall and May 1996) 22 Dec 2001 Hidalgo 26 Act 2001 Cameron 35+ SO Cet (Abbort 2001); All year (FL) (Westfall and May 1996) 22 Dec 2001 Hidalgo 26 Act 2001 Act 2001 Hidalgo 27 Oct (Abbort 2001); All year (FL) (Dankle 1990) 22 Dec 2001 Hidalgo 27 Oct (Abbort 2001); All year (FL) (Dankle 1990) 22 Dec 2001 Hidalgo 20+ Hidalgo 20+ Sop (Abbort 2001); All year (FL) (Dankle 1990) 22 Dec 2001 Hidalgo 20+ Hidalgo 20+ Sop (Abbort 2001); All year (FL) (Dankle 1990) 22 Dec 2001 Hidalgo 20+ Hidalgo 20+ Sop (Abbort 2001); Dec (TX) (Aecdham et al. 2000) 35 Dec 2001 Hidalgo 20+ Sop (Abbort 2001) 35 Dec 2001 Hidalgo 30+ Sop (A	Neoneura amelia (P)	23 Sep (Abbott 2001)	13 Oct 2001	Hidalgo	c. 16	Floating detritus at Rio Grande edge
6 (S) 14 Oct (Abbort 2001); 15 Nov (FL) (Westfall and May 1996) 28 Dec 2001 Starr A01 November (Abbort 2001); All year (FL) (Westfall and May 1996) 20 Cot (Abbort 2001); All year (FL) (Westfall and May 1996) 20 Dec 2001 Hidalgo 25+ 2 Oct (Abbort 2001); All year (FL) (Westfall and May 1996) 22 Dec 2001 Hidalgo 26+ 2 An 2000 Hidalgo 27 Cot (Abbort 2001); All year (FL) (Dankle 1990) 22 Dec 2001 Hidalgo 26+ 2 Sep (Abbort 2001); All year (FL) (Dankle 1990) 13 Cot 2001 Hidalgo 26+ 2 Sep (Abbort 2001); Dec (FL) (Dankle 1990) 14 Oct 2001 Hidalgo 26+ 2 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 15 Dec 2001 Hidalgo 27 2 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 26 Dec 2001 Hidalgo 34 2 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 36 Dec 2001 Hidalgo 27 2 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 36 Dec 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 37 Cot 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 37 Cot 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 37 Cot 2001 Hidalgo 37 3 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 37 Cot 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Needham et al., 2000) 37 Cot 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 13 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Dec 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct 2001 Hidalgo 27 3 Sep (Abbort 2001); Dec (TX) (Dankle 1989) 12 Oct	Argia apicalis (S)	2 Oct (Abbott 2001); 25 Oct (AR) (Westfall and May 1996)	22 & 26 Dec 2001	Hidalgo	1 and 1	Bare ground at Rio Grande edge
November (Abbort 2001); 15 Nov (FL) (Westfall and May 1996)	A. immunda (S)	6 Nov (Abbott 2001)	28 Dec 2001	Starr	34	Shaded drainage ditch near Rio Grande
No late U.S. dates published	A. moesta (S)	November (Abbott 2001); 15 Nov (FL) (Westfall and May 1996)	28 Dec 2001	Starr	40+	Open and weedy Rio Grande edge
20 Oct (Abbott 2001); All year (FL) (Westfall and May 1996) 25 Dec 2001 Hidalgo 27; American 27 Cot (Abbott 2001); Thor (AR) (Westfall and May 1996) 22 & 26 Dec 2001 Hidalgo 28; Abbott 2001); Thor (AR) (Westfall and May 1996) 22 Boc 2001 Hidalgo 29; Abbott 2001); Abbott 2001); Abbott 2001); Abbott 2001); Abbott 2001); Abbott 2001); Abbott 2001) Abbott 2001); Abbott 2001) Abbott 2001) Abbott 2001); Abbott 2001); Abbott 2001); Abbott 2001) Abbott 2001); Abbott 2001) Abbo	A. rhoadsi (P)	No late U.S. dates published	5 Oct 2001	Kinney	50+	Shrubs, ditch, creek & stream edge
29 Dec 2001 Cameron 35+ 29 Dec 2001 Gameron 35+ 21 A Oct (Abbott 2001); 7 Nov (AR) (Westfall and May 1996) 22 & 20 Dec 2001 Hidalgo 15+ 29 Dec 2001 Hidalgo 20+ 20 Ct 3001 Hidalgo 30+ 20 Ct 3001 Hidalg	A. sedula (S)	20 Oct (Abbott 2001); All year (FL) (Westfall and May 1996)	26 Dec 2001	Hidalgo	25+	Open and weedy Rio Grande edge
27 Oct (Abbott 2001); 7 Nov (AR) (Westfall and May 1996) 22 & 25 a 50 Dec 2001 Hidalgo 16+ 28 Dec 2001 Start 2 29 Dec 2001 Hidalgo 20+ 21 Jan 2000 Hidalgo 20+ 22 Jan 2000 Hidalgo 20+ 23 Sep (Abbott 2001); 24 Dec (FL) (Dunkle 1990) 22 Dec 2001 Hidalgo 20+ 25 Sep (Abbott 2001) 10+ 26 Sep (Abbott 2001) 25 Sep (Abbott 2	Same (S)		29 Dec 2001	Cameron	35+	Open and weedy Rio Grande edge
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The color of the	Enallagma novaehispaniae (S)	14 Oct (Abbott 2001)	22 Dec 2001	Hidalgo	15+	Sheltered shrubs near Rio Grande edge
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28 Sep (Abbott 2001) 4 Oct 2001 Presidio 2 males 2 Oct 2001 4 Sep (Abbott 2001) 4 Sep (Abbott 2001) 5 Sep (Abbott 2001) 2 S Aug (Abbott 2001) 2 S Aug (Abbott 2001) 2 Sep (Abbott 2001) 2 Sep (Abbott 2001) 2 Sep (Abbott 2001) 2 Sep (Abbott 2001) 3 Sep (Abbott 2001) 4 Oct 2001 4 Nov (Abbott 2001) 5 Sep (Abbott 2001) 5 Sep (Abbott 2001) 6 Sep (Abbott 2001) 7 Sep (Abbott 2001) 8 Sep (Abbott 2001) 9 Dec 2001 11 Hidalgo 10 Sep (Abbott 2001) 11 Sep (Abbott 2001) 12 Sep (Abbott 2001) 13 Sep (Abbott 2001) 14 Sep (Abbott 2001) 15 Sep (Abbott 2001) 16 Sep (Abbott 2001) 17 Sep (Abbott 2001) 18 Sep (Abbott 2001) 19 Dec 2001 10 Sep (Abbott 2001) 11 Sep (Abbott 2001) 12 Sep (Abbott 2001) 13 Sep (Abbott 2001) 14 Sep (Abbott 2001) 15 Sep (Abbott 2001) 16 Sep (Abbott 2001) 17 Sep (Abbott 2001) 18 Sep (Abbott 2001) 18 Sep (Abbott 2001) 19 Sep (Abbott 2001) 10 Sep (Abbott	Same (S)		22 Dec 2001	Hidalgo	8	Artificial pond and woodland edge
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4 Sep (Abbott 2001) 2 Sep (Abbott 2001); 2 Dec (TX) (Needham et al. 2000) 2 Sep (Abbott 2001); 2 Dec (TX) (Needham et al. 2000) 2 Sep (Abbott 2001) 2 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 2 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 2 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 3 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 3 Sep (Abbott 2001); 2 Jan (FL) (Paulson 2001) 4 Nov (Abbott 2001); All year (Dunkle 1989) 3 Sep (Abbott 2001); All year (Dunkle 1989) 4 Sep 2001 5 Sep 200	Erpetogomphus compositus (S)	25 Sep (Abbott 2001)	2 Oct 2001	Presidio	2	Shrubby Rio Grande edge
25 Oct (Abbott 2001); 2 Dec (TX) (Needham et al. 2000) 26 Dec 2001 Hidalgo 1 28 Aug (Abbott 2001) 3 Oct 2001 Presidio 2 23 Sep (Abbott 2001) 12 Jan (FL) (Paulson 2001) 21 Sep 2001 Hidalgo 1 23 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 25 Dec 2001 Hidalgo 1 24 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 1 25 Oct (Abbott 2001); 12 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 2 26 Oct (Abbott 2001); Ali year (Dunkle 1989) 13 Oct 2001 Hidalgo 4 30 Sep (Abbott 2001); 2 Dec (FL) (Needham et al. 2000) 7 Sep 2001 Kinney 2 31 Oct (Abbott 2001); Ali year (Dunkle 1989) 7 Sep 2001 Kinney 2 32 May (Abbott 2001); Ali year (Dunkle 1989) 21 Dec 2001 Hidalgo 2 33 May (Abbott 2001); Ali year (Dunkle 1989) 22 Dec 2001 Hidalgo 2 34 Hidalgo 201 Hidalgo 201 Hidalgo 2 35 May (Abbott 2001); Ali year (Dunkle 1989) 22 Dec 2001 Hidalgo 2	Cannaphila insularis (P)	4 Sep (Abbott 2001)	8 Sep 2001	Kinney	c. 8	Weedy drainage ditch
28 Aug (Abbott 2001) 3 Oct 2001 Presidio 2 23 Sep (Abbott 2001) 25 Dec 2001 Hidalgo 3 23 Sep (Abbott 2001) 12 Jan (FL) (Paulson 2001) 21 Sep 2001 Hidalgo 1 28 Oct (Abbott 2001) 13 Sep (Abbott 2001) 14 Jan 1 28 Oct (Abbott 2001) 15 Jan (FL) (Paulson 2001) 25 Dec 2001 Hidalgo 1 4 Nov (Abbott 2001) 14 Jan 15 Dec 2001 Hidalgo 1 4 Nov (Abbott 2001) 15 Dec (FL) (Necdham et al. 2000) 1 Dec 1990 Harris 1 53 May (Abbott 2001) 15 Jan (FL) (Paulson 2001) 1 Dec 1990 Harris 2 males 10 November (Abbott 2001) 15 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 10 November (Abbott 2001) 15 Jan (FL) (Paulson 2001) 21 Dec 2001 Hidalgo 2 11 Midalgo 15 Jan (FL) (Paulson 2001) 21 Dec 2001 Hidalgo 2 11 Midalgo 15 Jan (FL) (Paulson 2001) 21 Dec 2001 Hidalgo 2	Dythemis fugax (S)	25 Oct (Abbott 2001); 2 Dec (TX) (Needham et al. 2000)	26 Dec 2001	Hidalgo	_	Weedy Rio Grande edge
28 Sep (Abbott 2001) 25 Dec 2001 Hidalgo 3 28 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 19 Dec 2001 Harris 4 18 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 1 13 Sep (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 25 Dec 2001 Hidalgo 6-8 4 Nov (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 13 Dec 2001 Hidalgo 4 30 Sep (Abbott 2001); All year (Dunkle 1989) 1 Dec 1999 Harris 1 23 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 males November (Abbott 2001); Jun (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 10 Dec 2001 Hidalgo 2 2	D. maya (P)	28 Aug (Abbott 2001)	3 Oct 2001	Presidio	2	Small, spring fed shaded desert stream
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18 Sep (Abbott 2001) 21 Sep 2001 Hidalgo 1 28 Oct (Abbott 2001); 12 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 1 13 Sep (Abbott 2001); 6 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 2 4 Nov (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 13 Oct 2001 Hidalgo 6-8 30 Sep (Abbott 2001); All year (Dunkle 1989) 1 Dec 1999 Harris 1 31 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 males November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 12 Dec 2001 Hidalgo 2	Erythrodiplax minuscula (S)	23 Sep (Abbott 2001); 12 Jan (FL) (Paulson 2001)	19 Dec 2001	Harris	4	Low grasses and trail at pond edge
28 Oct (Abbott 2001); 12 Jan (FL) (Paulson 2001) 26 Dec 2001 Hidalgo 1 13 Sep (Abbott 2001); 6 Jan (FL) (Paulson 2001) 27 Dec 2001 Hidalgo 2 28 Oct (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 29 Dec 2001 Hidalgo 6-8 30 Sep (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 31 Oct (Abbott 2001); Dec (FL) (Needham et al. 2000) 31 Oct (Abbott 2001); All year (Dunkle 1989) 32 May (Abbott 2001); All year (Dunkle 1989) 33 May (Abbott 2001); Jan (FL) (Paulson 2001) 34 Dec 2001 Kenedy 35 Midalgo 25 36 Dec 2001 Hidalgo 27	Macrothemis inacuta (P)	18 Sep (Abbott 2001)	21 Sep 2001	Hidalgo	_	Woodland edge at irrigation channel
13 Sep (Abbott 2001); 6 Jan (FL.) (Paulson 2001) 26 Dec 2001 Hidalgo 2 4 Nov (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 23 Dec 2001 Hidalgo 6-8 30 Sep (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 13 Oct 2001 Hidalgo 4 31 Oct (Abbott 2001); Dec (FL) (Needham et al. 2000) 1 Dec 1999 Hidalgo 1 23 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 An ovember (Abbott 2001); 9 Jan (FL) (Paulson 2001) 22 Dec 2001 Hidalgo 2	Miathyria marcella (S)	28 Oct (Abbott 2001); 12 Jan (FL) (Paulson 2001)	26 Dec 2001	Hidalgo	_	Weedy Rio Grande edge
4 Nov (Abbott 2001); Mid-Nov (TX) (Dunkle 1989) 23 Dec 2001 Hidalgo 6-8 30 Sep (Abbott 2001) 31 Oct (Abbott 2001); Dec (FL) (Needham et al. 2000) 1 Dec 1999 Harris 1 23 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 2 males November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 22 Dec 2001 Hidalgo 2	Micrathyria aequalis (S)	13 Sep (Abbott 2001); 6 Jan (FL) (Paulson 2001)	26 Dec 2001	Hidalgo	2	Grassy water treatment pond edge
30 Sep (Abbott 2001) 31 Oct (Abbott 2001); 2 Dec (FL) (Needham et al. 2000) 1 Dec 1999 1 Dec 1999 1 Hidalgo 4 Harris 1 Dec 1999 1 Harris 2 males 23 May (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 22 Dec 2001 31 Oct (Abbott 2001); 9 Jan (FL) (Paulson 2001) 22 Dec 2001 33 Hidalgo 34 Amales 4 Amales 5 males 5 males 7 Sep 2001 5 Dec 2001 7 Renedy 5 Midalgo 5 Midalgo 7 Sep 2001 7 Midalgo 7 Sep 2001 7 Sep 200	M. hagenii (S)	4 Nov (Abbott 2001); Mid-Nov (TX) (Dunkle 1989)	23 Dec 2001	Hidalgo	8-9	Grassy pool edge
31 Oct (Abbott 2001); 2 Dec (FL) (Needham et al. 2000) 1 Dec 1999 Harris 1 23 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 males November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 22 Dec 2001 Hidalgo 2	Perithemis domitia (S/P)	30 Sep (Abbott 2001)	13 Oct 2001	Hidalgo	4	Shrubs & grasses at pond edge
23 May (Abbott 2001); All year (Dunkle 1989) 7 Sep 2001 Kinney 2 males November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 22 Dec 2001 Hidalgo 2	Sympetrum ambiguum (P)	31 Oct (Abbott 2001); 2 Dec (FL) (Needham et al. 2000)	1 Dec 1999	Harris	-	Sunny trail at pond edge
November (Abbott 2001); 9 Jan (FL) (Paulson 2001) 21 Dec 2001 Kenedy 2 22 Dec 2001 Hidalgo 2	Tramea insularis (V)	23 May (Abbott 2001); All year (Dunkle 1989)	7 Sep 2001	Kinney	2 males	Territorial at large, spring fed pool
22 Dec 2001 Hidalgo 2	Tramea onusta (S)	November (Abbott 2001); 9 Jan (FL) (Paulson 2001)	21 Dec 2001	Kenedy	2	Hunting over grassy pool edge
	Same (S)		22 Dec 2001	Hidalgo	2	Hunting over residential lawn

Dunkle, S.W. 2000. Dragonflies through binoculars: A field guide to Dragonflies of North America. Oxford: Oxford University Press.

Eubanks, T.L., R.A. Behrstock and J.C. Abbott. 2001. Odonata (Dragonflies and Damselflies) of the Lower Rio Grande Valley.

http://www.fermatainc.com/nat_odonates.html

Mauffray, W. 1999. The Dragonflies and Damselflies (Odonata) of Louisiana. http://www.afn.org/~iori/lalist.html

Mauffray, Bill. 2000. The Dragonflies and Damselflies (Odonata) of Georgia. http://www.afn.org/~iori/galist.htm

Needham, J.G., M.J. Westfall, Jr. and M.L. May. 2000. Dragonflies of North America. Gainesville: Scientific Publishers.

National Climatic Data Center. 2001. Climate of 2001 - Annual review. preliminary report. http://lwf.ncdc.noaa.gov/oa/climate/research/2001/preann2001/preann2001.html

Paulson, D.R. 2001. Recent Odonata records from southern Florida - effects of global warming? International Journal of Odonatology 4(1): 57-69 Westfall, M.J. and M.L. May. 1996. Damselflies of North America. Gainesville: Scientific Publishers.

HOBBY FALCONS AND DRAGONFLIES

Sid Dunkle, Plano, Texas

A chapter in the book "Curious Naturalists", by ethologist Niko Tinbergen (1958), discusses the habits of the European Hobby (Falco subbuteo) in The Netherlands. I had read that Hobbies routinely prey dominantly on dragonflies, but this is the first time I have come across any details. (The second most common type of prey caught by the Hobbies were swifts!) Their flat glide back to the nest over 2.5 km was at a speed of at least 150 kph (90 mph); their hunting stoop must be much faster. That dragonflies could give such a predator any trouble is a tribute to the aeronautical prowess of the dragonflies. Tinbergen relates: "... we often saw prolonged, determined swoops over distances of 100 to 200 yards, ending in a quick, zigzagging dash. In such cases we could often see that they were catching dragonflies. After seizing them they usually broke off the wings and ate the rest." This was done high in the air and on the wing. Some pairs of nesting Hobbies specialized on insects such as dragonflies, others on birds. They could see dragonflies up to 200 m away, twice as far as the unaided human eye. One pair brought 70 dragonflies to the nest in 4 hours.

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BAT FALCONS AND DRAGONFLIES

Nick Donnelly

Sid Dunkle's interesting note on European falcons catching dragonflies prompts me to include a note on the New World tropical bat falcon (Falco rufigularis petoensis). Between 1962 and 1983 I visited the spectacular ruins at Tikal on seven trips. Between 1962 and 1969 visitors would fly to a dirt airstrip in a DC-3; more recently visitors fly to Flores and drive to the ruins. The airstrip was close to the lodge, and in the evening it was a short stroll from the lodge to look for night-flier dragonflies (Gynacantha nervosa, Triacanthagyna caribbea, T. septima), which swarm on the edge of the airstip for only about fifteen minutes as the sun sets.

Bat falcons are resident in the forest and commonly perch on the tops of the Mayan temples during the day. At sundown they often fly over to the airstrip to hunt for dragonflies. On several occasions I watched them from a distance of only about twenty meters as they caught large dragonflies directly in front of me. The method was interesting. They would swoop down from the rear and pass beneath the dragonfly. Doing a barrel roll, they pulled the dragonfly down to them as they passed underneath. I have seen the same technique used by a Cooper's hawk in Wyoming catching horned larks in open country. I presume that catching the prey from below prevents it from escaping by dropping.

In Misiones, Argentina, I have seen plumbeous kites (*Ictinia plumbea*) hunting large dragonflies (*Coryphaeschna perrensi*) at dusk, but I never witnessed the actual capture. Now I am curious: what are the actual capture techniques of falcons and kites?

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GEORGIA UPDATE

Bill Mauffray

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The Georgia Dragonfly Survey GDS, as coined by Alan Harvey, has emerged and will be officially launched at the Georgia Entomological Society meeting being held in Statesboro this spring. Although we have no new state records to mention for the 2001 season, over a hundred new county records have been added, mainly through the continuing efforts of Giff Beaton, a well known birder who got the "dragonfly bug" and has brought his photographic and field expertise into the picture.

Giff Beaton has enjoyed the outdoors for over 25 years, and is especially interested in the identification and photography of Odonates and birds. He has been working with me on the Georgia Odonata mapping project for about four years, and has been scouring the state for additional county records during that time. He is an airline pilot and lives in Marietta GA.

Alan Harvey is Assistant Professor of Biology at Georgia Southern University. Although most of his research involves hermit crabs, he has always been interested in dragonflies. Alan and his students are studying the systematics of *Erythemis* and developing a "passive marking" technique for dragonflies.

The GDS web site will be a consolidation of Alan Harvey's web based illustrated key, his maps, data from my list currently on the web, Giff Beaton's images, as well as, links to images of others such as Forrest Mitchell's excellent Digital Dragonflies site. The GDS Site is maintained by Alan Harvey and is hosted by the Biology Department at Georgia Southern University. The site will be continuously updated and expanded, you can see the latest version at http://www.bio.gasou.edu/bio-home/Harvey/ga.dragons.html

It will be the goal of the GDS, that a comprehensive state list be published in BAO and co-authored by the three of us sometimes within the next 3 years. If any one has Georgia data please e-mail me @iori@afn.org. or you can go to the GDS web site and fill in the online form provided by Alan Harvey.

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ATTACHMENT DEVICES OF INSECT CUTICLE, Stanislav Gorb, Kluwer Academic Publishers, 2001, Dordrecht, The Netherlands.

Reviewed by Roy Beckemeyer

DSA member Stas Gorb, of the Ukraine, has been conducting research in some esoteric areas focused on the microstructure of insect cuticle. A number of his studies have used Odonata as model organisms. ARGIA readers may remember my short review (Beckemeyer, 1997) of his study in PETALURA (Gorb, 1993) on the head-arresting system that stabilizes damselfly and dragonfly heads when the insects are perched or otherwise not in free flight. This book deals with a larger subject of which the head-arrester system is an example: the macro- and micro-structures found on insect cuticle (setae, spines, sensillae, bristles, hooks, pores, wax layers, etc.) and generally involved in attachment of insects to substrates or to other Filled with marvelous scanning electron microscope pictures, the book is an overview of the state of the art in a vibrant field of research. Specific information on Odonata includes a detailed review of the head-arresting system, information on cuticular attachment during copulation, and the presence of structures on ovipositors that function to help move eggs out through the ovipositor. SEM microphotographs of Odonata include ovipositors of Calopteryx splendens, attachment of the male anal appendages to female prothoraces in Platycnemis latipes and Lestes barbarus, inner surfaces of the ovipositor valvulae of Sympecma annulata, the head-arrester post-cervicle sclerite and the microtrichia field on the back of the head of Sympetrum sanguineum, and details of these structures for Perissolestes romulus and Aeshna mixta. In the non-Odonata groups, such wonders as wing-locking devices, and the functioning of tarsi (e.g., how flies walk) are covered. Insect cuticle is a remarkable organic material; this book gives some insight into just how remarkable it is.

References:

Beckemeyer, Roy, 1997, Functional morphology of tandem flight in Odonata, Argia, 9:13-17

Gorb, S., 1993, The skeleton-muscle organization of the head-fixation system in odonates and its evolutionary implications: a comparative study, Petalura: Ann. J. SGSPO, 1:3-20

FIXED AND FLAPPING WING AERODYNAMICS FOR MICRO AIR VEHICLE APPLICATIONS, T.J. Mueller (Ed.), 2001, Vol. 195, Progress in Astronautics and Aeronautics, American Institute of Aeronautics and Astronautics, Reston, Virginia.

Reviewed by Roy Beckemeyer

The study of insect flight has gone on in various universities throughout the world for many years, usually by researchers who have had to struggle to find funding. Then, in the mid 90's, after the success of the high-tech weaponry in the Gulf War, the Defense Research Projects Agency (DARPA), Naval Research Lab, and other government weapons research organizations started thinking about how useful very small unmanned surveillance vehicles (bird and insect-sized) might be. Voilà the MAV (Micro-Air-Vehicle) era was born, and funds started to flow. Now super computers solving the Navier-Stokes equations for threedimensional flow fields around flapping wings, computer models of insect wing vein and membrane structures, and tests of wings and airfoil sections at very low Reynolds Numbers (RN) are being funded by the government. Lots of insight is being gained into how insects fly (one of the MAV's is called "Robofly"), and exciting things are going on in the field. It is even becoming hard to keep up with it all. This book contains a set of papers dealing primarily with low-speed and small scale (low RN) aerodynamics. One paper in particular is directly applicable to Odonata: Akira Azuma, Masato Okamoto and Kunio Yasuda's paper (Chapter 17 of the book, pp. 341-391), "Aerodynamic characteristics of wings at low Reynolds Number". It recounts their pioneering work on dragonfly and damselfly aerodynamics that was originally published in the Journal of Experimental Biology. Anyone who has worked or been interested in the flight mechanics of Odonata would find that chapter and portions of the rest of this book of interest.

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THE NATURE OF NEBRASKA: ECOLOGY AND BIODIVERSITY, Paul A. Johnsgard, 2001, University of Nebraska Press, Lincoln.

Reviewed by Roy Beckemeyer

Paul Johnsgard is well known to birders and ornithologists. He is a prolific author, having produced forty books, mostly ornithological, over a forty year professional career. He has also published on more general natural history topics, particularly on the Great Plains. This book is an excellent summary of "natural" Nebraska and its ecological communities. It contains checklists of fauna and flora, these including for the invertebrate groups, Tiger Beetles, Carrion Beetles, common Scarabs, Grasshoppers, mantids and walking sticks, butterflies, selected moth families, freshwater mussels, and dragonflies and damselflies. latter list is based largely on the one that I generated and posted on my web site for the 1998 DSA meeting in Valentine, but includes a couple of new county (photographic) records provided to Paul by John Sullivan (Arigomphus submedianus from Douglas County and Gomphus militaris from Lancaster County) as well as a reference that I had missed, an MS thesis from 1934 (Keech, C.F., The Odonata of Nebraska, Univ. Nebraska Lincoln). In addition to the checklists, the book contains references to identification aids such as Sid Dunkle's "Dragonflies through binoculars" and my and Don Huggins' "Checklist of Kansas Dragonflies". Hopefully Paul's book will inspire folks in the Cornhusker state to become more interested in dragonflies.

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DRAGONFLIES AND DAMSELFLIES OF NORTHEAST OHIO. By Larry Rosche, Cleveland Museum of Natural History, 94 pp., spiral bound, \$18.95. The Cleveland Museum of Natural History,1 Wade Oval Drive, University Circle, Cleveland, Ohio 44106-1767. The author

suggests that for purchase you contact Renee Boronka at rboronka@cmnh.org

Reviewed by Nick Donnelly

This surpassingly gloomy late winter day suddenly became very sunny when the afternoon mail brought a copy of Larry Rosche's "Dragonflies and Damselflies of Northeast Ohio". I had one of those "wow" moments when I leafed through it. Its spiral binding and sturdy construction will guarantee its presence is numerous pocket and field bags during the upcoming field season.

It is not only thorough, but beautifully illustrated. The illustrations (acrylics?) are both elegant and accurate, and are some of the most useful and attractive I have ever seen. The accompanying text gives field identification marks and a brief description of habits and habitat. The book also reminds me that we have a lot of survey work to do just a few miles away in western New York!

If you live anywhere east of the Mississippi you will find this book indispensable.

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MISCELLANEA

FSIO REPORT

Bill Mauffray

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North American memberships in the Foundation SIO have been increasing steadily over the last year. The IORI handles the membership fee which includes subscriptions and distribution for Odonatologica and Notulae for all of North America including Mexico and Canada.

One thing that has helped is the Student special supplement offered by the IORI so that students pay only \$64.00. This is offered only by the IORI as a small grant to help students of Odonatology and is available for students world wide. The condition for student rates is that the applicant submit a brief explanation of their studies and agree to provide the IORI with any reprints or copies of any publications they are ever involved in. For more information you can visit the web site http://www.afn.org/~iori/siointro.html

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IORI UPDATE

Bill Mauffray

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IORI book and envelope sales remained brisk through 2001. Profits were used to build almost an entire row of cabinets for collection expansion at the FSCA/IORI adding over 800 drawers of storage space. A technician was hired to expand the collection and to re-label all the drawers

We have completely sold out of Sid Dunkle's Florida guides and the publisher has no more either. It is hoped that Sid will update the Florida guides and publish 2nd editions. We have no pending books to announce at this time. The IORI will handle the sale on any publications under the condition that we can take advanced orders beginning at least 6 months in advance and that we are given bulk rate pricing. We usually will not handle a new book after it is already published, unless it is an exclusive relationship.

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FSCA TO DOUBLE ODONATA SECTION

Bill Mauffray

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The Florida state collection of Arthropods (FSCA) has scored a NSF grant covering much needed expansion of the collection. A portion of the grant will be used to build an entire double row of Odonata cabinets expanding the existing 1216 drawers to a projected 2432. Also shelves and work space will be built along the back wall adjacent to the existing Odonata cabinets so that the entire Odonata reference library and archives can be housed there making it easier for researchers to do their work without having to go to 3 different places as it exists now. The 4 year grant extends into early 2004 at which time all projects should be completed.

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WDA'S 3RD INTERNATIONAL SYMPOSIUM OF ODONATOLOGY, MURRAY DARLING FRESHWATER RESEARCH CENTRE, COOPERATIVE RESEARCH CENTRE FOR FRESHWATER ECOLOGY, BEECHWORTH, AUSTRALIA, JANUARY 7-13, 2003.

An official invitation to host the 3rd WDA Symposium in Australia in 2003 was made by John Hawking during the 2nd (Swedish) Symposium being held in July 2001. The Symposia Committee feels it important to give advance notice of this exciting event so that members, and anyone else with an interest in Odonata, may make their plans for early 2003 with the following dates in mind.

Location: The symposium is to be held at the historic town of Beechworth, in north-east Victoria, between the two major Australian capital cities,

Sydney and Melbourne. Beechworth is a beautiful little town, nestled in the foothills of the Australian Alps. It was a major commercial centre for the Ovens Goldfields during the gold rush of the 1850's. It is now classified as a "Notable" heritage town with over 30 buildings on the National Trust's register, with many of the buildings dating back to the 1860's. Over 40 species of damselflies and dragonflies can be found in the area, with Ischnura heterosticta. Griseargiolestes intermedius. Eusynthemis brevistyla, Austrogomphus guerini, Hemigomphus gouldii, Spinaeshna tripunctata. and Orthetrum caledonicum being common in nearby Spring and Reid Creek, while at Lake Sambell Ischnura aurora, Xanthagrion erythroneurum, Austroagrion watsoni, Austrolestes leda, Hemianax papuensis. Hemicordulia tau and Diplacodes bipunctata can be found in plentiful numbers.

Venue: The symposium venue will be the historic May Day Hills Campus of La Trobe University which occupies a 106 hectares site of the old Mayday Hills hospital. The University has created a unique special educational environment amongst the heritage gardens and historical buildings. The campus accommodation ranges from International Hotel rooms, to Conference Hotel rooms, to shared cottages and backpack accommodation.

Mid Symposium Field Trip: The field trip will follow the Kiewa River from its source in the beautiful Snow Gum ridges of the Bogong High Plains down to the lush farming valley where it joins the mighty River Murray. We will travel 100 km, over an altitudinal decline of 1400m, and encounter some 25 species of dragonflies which occupy discrete zones along the river. We will visit the alpine village of Falls Creek, pass through the Hydro-electricity town of Mount Beauty and on down to the sleepy country village of Tangambalanga.

Post Symposium Field Trip: The field trip will combine dragonfly collecting with visits to cultural and heritage areas. We will visit the site of the world's most primitive odonate, Hemiphlebia mirabilis, which will be flying, and sites of other Gondwanan dragonflies, like Austropetalia tonyana and Telephlebia brevicauda. We will also visit National Parks with their spectacular scenery, brightly coloured wildflowers, and Australian fauna.

Links to Further information: http://powell.colgate.edu/wda/Australia/Home_pag e.htm

WILLIAM EDWIN RICKER, 1908-2001

Born in Waterdown, Ontario in 1908, William Edwin Ricker died on 8 September 2001, in Nanaimo, B.C. Rob Cannings, of the Royal British Columbia Museum and a past president of the British Columbia Entomological Society, has written a biography of Bill Ricker for the Entomological Society of British Columbia.

Mainly a fisheries biologist and an authority on stoneflies (Plecoptera), Ricker also had an interest in and considerable knowledge of dragonflies. He co-authored a paper on the Odonata of Cultus Lake with E.M. Walker, who, in another paper named the British Columbia *Macromia rickeri* (now generally considered a dark northern race of *M. magnifica*) from Cultus Lake in his honor.

Rob wrote, "I was fortunate to know Bill Ricker personally, although we met only a few times. He was a wonderful man. I remember the pleasure I had in delivering to him, in 1989, the framed certificate of his Honorary Life Membership in the Society. But mostly I remember the conversations I had with him about dragonflies. My own work on these insects benefited from his explorations of aquatic insect life in B.C., and I was intrigued by his descriptions of research in those early days. He took me around Nanaimo to his favourite haunts and delighted in showing me the antics of the brilliant red Sympetrum illotum (Cardinal Meadowhawk) flashing around ponds on the city's golf course."

TRAMEA

IORI WEB SITE

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I added a link to Roy Beckemeyer's and Dennis Paulson's Bibliography site. This badly needed reference tool is one more step towards a single portal including a world wide list, with links to all known images for each species, distributional information, links with maps, original description literature links, and even Keys. I know this idea has been floating around for a while and parts of the puzzle are already in place. A number of people will probably have to be involved in developing different aspects of this mega site.

Meanwhile check out the IORI site at www.afn.org/~iori if you have not been there lately. The e-mail directory is updated frequently. Check your information to see if it is correct, if not then e-mail me with the corrections. Activity on the North America list has slowed down somewhat. If you have any new state records or deletions to submit, please notify me. While on the site check out the books and supplies available. All profits go to the IORI.

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The updated Italian odonata site is:

http://www.procidamix.com/odonata.htm (from Costantino dr. D'Antonio.)

Has everybody recorded the new URL for Ode News? It is http://www.odenews.net/

The Georgia Dragonfly Survey is http://www.bio.gasou.edu/bio-home/Harvey/ga.dragons.html

BACK ISSUES OF ARGIA AND THE BULLETIN OF AMERICAN ODONATOLOGY

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Bell, p. 49-54	
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Additions to the Description of Gomnphomacromia nodisticta Ris 1928 (Odonata: Corduliidae), N. von Ellenrieder, p. 7-11	
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ARGIA

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Vol. 14, No. 1, 20 March 2002

In This issue		1
DRAGONFLY DAYS, 17-18 MAY 2002		2
MIDSOUTH ODONATA MEETING, 16-19 MAY 2002		2
DSA MEETING IN WEST VIRGINIA, 20 –23 JUNE 2002		2
2002 GREAT LAKES ODONATA MEETING, 1-4 JULY 2002		3
NORTHEASTERN DSA MEETING IN TUG HILL PLATEAU, NEW YORK, $12-14$ JULY 2002		3
2002 ODONATE SEMINARS AT THE HUMBOLDT INSTITUTE ON THE COAST OF MAINE		3
CONNECTICUT RECORDS OF SYMPETRUM CORRUPTUM AND SOUTH AMERICAN COENAGRIONIDS	Fred Sibley	3
TWO NEW DAMSELFLIES FOR NEVADA	John Abbott and Robert Larsen	4
A NEAT DISCOVERY	Jim Johnson	4
A FISTFUL OF BOLIVIANOS!	Jerrell Daigle	5
MISCELLANEOUS NOTES ON BRITISH VIRGIN ISLAND DRAGONFLIES	Fred Sibley	5
ODONATA OF ST THOMAS AND ST JOHN, VIRGIN ISLANDS	Nick Donnelly	7
MICRATHYRIA DEBILIS FROM JAMAICA	Fred Sibley	9
TELEBASIS DEMERARUM IN TRINIDAD	Dennis Paulson	9
NEW LATE FLIGHT DATES FOR TEXAS ODONATA INCLUDING 20 LATE RECORDS FOR THE UNITED STATES	Robert A. Behrstock	9
HOBBY FALCONS AND DRAGONFLIES	Sid Dunkle	13
BAT FALCONS AND DRAGONFLIES	Nick Donnelly	13
GEORGIA UPDATE	Bill Mauffray	13
BOOK REVIEW: ATTACHMENT DEVICES OF INSECT CUTICLE, by Stanislav Gorb		14
BOOK REVIEW: FIXED AND FLAPPING WING AERODYNAMICS FOR MICRO AIR VEHICLE APPLICATIONS, ed. T.J. Mueller		14
BOOK REVIEW: THE NATURE OF NEBRASKA: ECOLOGY AND BIODIVERSITY, by Paul A. Johnsgard		15
BOOK REVIEW: DRAGONFLIES AND DAMSELFLIES OF NORTHEAST OHIO. by Larry Rosche	Nick Donnelly	15
MISCELLANEA		15
WILLIAM RICKER 1908-2001		16
TRAMEA		17