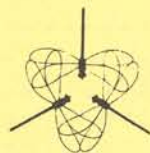


ARGIA

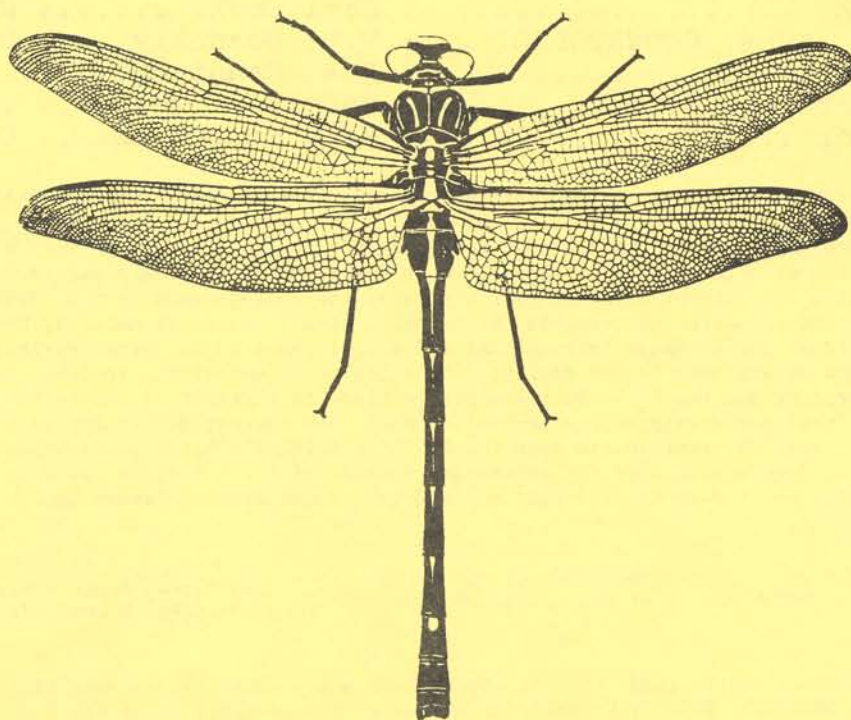


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ARGIA

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DECEMBER 15, 1991  
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FIELD NOTES OF AN URBAN ODONATIST
(Or the Quest for Odonates in a Shopper's Paradise)

Allen E. Barlow, Jr.

411B Passaic Street, Hackensack, NJ 07601, USA

Within a scant few miles of New York City, odonate habitats range from the harshest to some of the gentlest I've yet seen in New Jersey. This sort of contrast is fascinating as is the species diversity that results. At times I cannot help but be impressed by the tenacity of some species to live in waters which I would not even wade in! On the other hand, I often longingly wonder what else lived in such places before man arrived on the scene. Originally settled by the Dutch in the 1600's, northeastern New Jersey has evolved from rural farmlands to ever increasing urban and suburban sprawl. I offer this article to all of you who live on the fringes of, or in the middle of, urban and suburban development. This should include just about everyone on the continent I would think! Careful searching, and as always, a bit of good luck, can result in pleasant surprises from unlikely places.

My "project" for the last two years has been to update the scant Odonata records of Bergen County, New Jersey, which lies due west of Manhattan Island, just across the Hudson River. As you might imagine, such close proximity to this large metropolis has had its affect on the landscape! Having grown up in the much more rural Morris County (30 miles west), Bergen looked at first like one very large subdivision to me. With heavy heart I wondered what self-respecting odonates could or would possibly call this place home? More important, would habitats remain between the abundant strip-malls, factories, and housing developments that dot our landscape? The answer to these questions has turned out to be a resounding YES! The current species list, based on the work of Philip Calvert, William Davis, Mike May, and recently myself, now stands at 82. Although some historical records are somewhat doubtful, this is an impressive number of species. Considering my initial impression of this area, I am doubly impressed.

Several species have notably benefited by man's encroachment here. Pond building by developers and the Parks Department has provided numerous habitats for a variety of species. My wife Nancy and I toured a sample of these spots in May and June 1991; all within four miles of downtown Hackensack, where green space is a foregone conclusion. Species most conspicuously seen at ponds were: *Enallagma civile*, *E. signatum*, *Ischnura verticalis*, *Arigomphus villosipes*, (very abundant), *Anax junius*, *Epithea princeps*, *Celithemis elisa*, (*C. eponina* was strangely absent), *Libellula luctuosa*, *L. lydia*, *L. pulchella*, *L. vibrans*, *Pachydiplax longipennis*, *Perithemis tenera*, *Pantala flavescens* (extremely abundant later in the season) and *Tramea lacerata*.

Epiaeschna heros was found to be quite common this year on the shadier streams feeding into some of these ponds.

At one factory pond, Nancy, not normally drawn to this sort of thing, seized my net and ferociously went after the *Arigomphus* landing on the banks. After several frustrating missed shots, she (and me) were rewarded with two of the largest *Arigomphus villosipes* I had ever seen. This species appears to be rather hardy, as we have seen it at most superficially suitable habitats where conditions ranged from very degraded to pristine.

Members of the genus *Argia* are apparently well represented here as well. Most notable is *Argia apicalis*, which, with *Enallagma exsulans* are time and time again the only species found on highly degraded streams and ponds here. John Michalski and I have noted the stamina of these two species elsewhere in New Jersey, and on the James River in Central Virginia. The water quality at each of these habitats was very poor. The Whippany River in Morris County, for example, is almost opaque after it passes Morristown's sewage plant. In spite of this degradation, *Argia apicalis* seems to survive quite well, and in large numbers!

This past June, while collecting here with John Michalski and Ken Soltesz, a large lake showing signs of degradation was explored. Trash conspicuously littered the shoreline, and a vaguely unpleasant odor wafted from the lake and a nearby stream. Here, among other species were found *Argia apicalis*, *A. fumipennis violacea*, *A. tibialis*, *A. translata*, also flying with these species were *Enallagma exsulans*, *E. geminatum* and *Erythemis simplicicollis*. Also taken by John was a very early *Sympetrum* (the *A. translata* and *E. geminatum* were county records for John and Ken, thanks guys!) Subsequent searches around this habitat revealed that the nearby stream runs right by a small sewage treatment plant, where it receives an unhealthy dose of effluent. At least now I know what causes the odor at the lake! In spite of this, the stream (Halifax Brook) is home to *Gomphus lividus*, *Calopteryx maculata*, *Enallagma exsulans*, and all of the previously mentioned Argias except *translata*.

Quite similar in profile to Halifax Brook is the Saddle River, which flows north-south through the center of the county. This wide, gentle flowing sand bottomed stream looks superficially ideal for odonates. Upon my first visit, my dreams of *Macromia* and *Ophiogomphus* were dashed when I got close enough to smell the stench from the river and look closely at it. The strong aroma of effluent, not to mention the numerous submerged tires, shopping carts and other dump-dandruff, probably explains why only *Argia apicalis* and *Enallagma exsulans* are brave enough to live here now. I wonder what flew over this river 75 years ago.

The Hudson River forms the eastern border of Bergen County, but it has produced only two odonate species to date, both surprises. Our border on this river warrants further work but difficult terrain is an obstacle for the collector. Bergen County's border with the Hudson is almost entirely dominated by basalt palisades which limit both access and the formation of suitable odonate habitats. In spite of these limitations, two localities have been visited repeatedly. Although

Enallagma civile appears quite abundantly throughout the county, it was especially abundant at these two Hudson localities on visits in August and September. The water at this section of the river is quite brackish, so this prolific occurrence is of considerable interest. On advise from Ken Soltesz, I searched for and eventually found *Enallagma durum* at the same two locations, although not in great abundance. Because the habitats in question did not appear ideal for *durum*, it seems possible the individuals seen may have been strays from further up the river.

While this sort of collecting is of intense interest, I grew anxious to find some of the more unusual species that occur elsewhere in northern New Jersey. I thought perhaps that these species might be disinterested in the "convenience" of easy highway access and side by side shopping malls! Therefore I next concentrated searching in the northern part of the county which borders with New York State. The \$3.00 map I bought at 7-Eleven showed extensive open spaces and parklands, with many rivers and lakes to checkout. With this intelligence in hand, I was off! The northern part of Bergen county still offers great challenges to the curious observer/explorer. It was at this point that I become acquainted with the lovely Ramapo Mountains. My first sight of them, after much time spent among refuse, sludgy water, and too many *Argia apicalis* brought great hope.

In stark contrast to the southern part of the county, the mountainous north is still relatively pristine, and for the most part accessible only on foot. Happily, much of this region is already Parkland and will hopefully remain untouched by suburban sprawl for future generations to enjoy.

In the heart of this wilderness is Bear Swamp Lake, one of my favorite localities. Originally Bear Swamp, a dam was erected at some past time, and a large pleasure lake created (as evidenced by the numerous abandoned cabins). Eventually the place was noticed by the Parks people and incorporated into the adjoining preserve. Bear Swamp Lake is relatively shallow and covered with abundant aquatic vegetation, and fed by several spring seepages. Some of the more noteworthy species found here include: *Lestes vigilax* (abundant), *Nehalennia irene*, *Enallagma geminatum*, *E. hageni*, *Arigomphus furcifer*, *Aeshna clepsydra*, *A. verticalis*, *Basiaeschna janata*, *Didymops transversa*, *Dorocordulia libera*, *Ladona julia*, *Leucorrhinia frigida*, *L. intacta*, *L. proxima* and many others. *Tachopteryx thoreyi* has also been taken quite near this lake. *Cordulegaster erronea* was reported by Philip Calvert from this locality, so far this remains only a literature record for this locality, but I have high hopes of rediscovering it here someday and adding it to my own list of personally collected species for the county and state.

Draining this lovely lake is a small sand-bottomed, rocky stream, the Bear Swamp Brook. On its way down the mountain, this shady stream takes on many different profiles before eventually emptying into the large Ramapo River. Normally the water flow is fast and deep. However, during the dryer months the brook seems to "disappear" into the sand, only to "reappear" again fifty feet downstream. It is along this brook, especially where it bisects a power-line cut high in the mountains, that some of the area's most noteworthy inhabitants occur.

These include: *Chromagrion conditum*, *Enallagma divagans*, *Stenogomphurus rogersi*, *Stylogomphus albistylus*, and *Somatochlora tenebrosa*. Along the open power-line cut, *Somatochlora tenebrosa* is extremely abundant from mid July to late August. Females have been observed ovipositing among patches of cattails growing where a gentle but steady flow of water occurs. Males patrol the brook itself, and nearby woodland roads with the height of activity being from 9:30 AM to Noon. Also found with some regularity on the shadier sections of the brook is *Boyeria grafiana*. As far as I know, this is only the second spot in New Jersey where *grafiana* has been found. This species, like it's cousin *vinosa* is extremely curious in flight and annoyingly difficult to catch. My first swing at one netted nothing more than an abdomen! Also found along the shady fringes of the stream is an occasional *Aeshna constricta* or *A. umbrosa*. I seem to find these two species along power-line cuts quite often, especially along the tree shaded borders.

Where the brook levels out and joins the Ramapo River, its character changes again to a gentle meandering flow. Here, *Lestes rectangularis*, *Epiaeschna heros*, *Nasiaeschna pentacantha* and *Libellula vibrans* are quite prolific. The Ramapo River itself, while not particularly rich in odonates, does support populations of *Argia fumipennis violacea*, *Dromogomphus spinosus* and *Boyeria vinosa* at this spot.

At a nearby location, Campgaw Mountain, hillside seepages and spring seeps permeate the landscape. At these locations the following species have been collected: *Amphiagrion saucium*, *Chromagrion conditum*, *Nehalennia gracilis*, *Tachopteryx thoreyi*, *Cordulegaster diastotops*, *Gomphaeschna furcillata*, *Libellula semifasciata*, *L. vibrans*, *Epithea cynosura*, also *Somatochlora tenebrosa* has been observed in fair numbers here as well.

This is really just a small sample of the species and habitats found here in Bergen County, New Jersey. Before moving here, my collecting activities had always been very casual and unstructured. Living in an urbanized region has taught me to look more carefully, diligently, and patiently for the animals and their habitats I seek, and perhaps to appreciate better that which I find. Many of us live in developed, or developing areas, and while not always easy or rewarding, careful scrutiny of these regions can yield surprising things. It can be a very useful teacher, I initially had very low expectations for this highly developed region, now I am wondering when my list will reach the 100 species mark! Good luck to you all in the upcoming New Year.

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**TACHOPTERYX THOREYI IN THE NORTHEAST U.S.  
Some New Information and Questions**

**Allen E. Barlow, Jr.**  
411B Passaic Street, Hackensack, NJ 07601, USA

This spring (1991), I was quite happy to discover a population of the relict dragonfly *Tachopteryx thoreyi* in Bergen County, New Jersey. This find represented the first truly tangible record for the state. The habitat where it was found is consistent with other reported habitats for this species; being in the vicinity of hill-side spring

seepages in relatively sunny areas. Males were observed searching tree trunks, presumably in search of mates. Individuals were also observed feeding over a small pond. The feeding flight was a figure eight pattern, very slow and regular. They interrupted this pattern only in pursuit of prey, or to chase an intruder off its territory. I initially thought I was watching a pair of *Nasiaeschna pentacantha* because of their very similar feeding flight behavior. Only after I caught one did I realize they were actually *Tachopteryx thoreyi*. Has anyone else observed this kind of behavior, or seen two individuals flying closely in this manner without fighting?

My first sightings occurred on June 2, and was followed by various additional sightings extending through early August, again consistent with numerous published accounts. The August sighting occurred at a location several miles distant from the first habitat and indicated to me the probable existence of a well established population in New Jersey, certainly a second colony exists. I assumed at the time that August was a rather late sighting date for this magnificent species and that I would have to wait until next spring to see it again. On September 30th, however, I was pleasantly surprised to encounter and net another fine male in the vicinity of the earlier August sighting, it was a rather chilly, dry day. The individual was not tattered and worn as an old specimen would be expected to be at this late date. I am rather perplexed by both the late date and fresh condition of the specimen. Has anyone else seen or heard of *Tachopteryx thoreyi* flying this late? I feel sure there is much still to learn about the range and biology of this uncommon species.

~~~~~

(Editor's comments: From my own experiences in the field, and accounts I have read in the literature, I have seen nothing approaching Allen's remarkable late capture date. I feel fairly certain his record establishes a new US late flight date for *T. thoreyi*.)

His account of their searching tree trunks for perching females, and the normally non-aggressive attitude of males toward others of the same sex is consistent with my own observations. I have never seen males exhibit territorial defense. On the contrary, two males may conduct searches of nearby trees without conflict. The only feeding behavior I've observed is feeding on rather large prey picked off vegetation or tree trunks-- butterflies (*Polytonia*), Hymenoptera, or other Odonata (*Calopteryx maculata*). Allen's observation of feeding flights over standing water has never previously been reported by others as far as I am aware.)

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#### FURTHER COMMENTS ON THE GENUS *SYMPETRUM*

Robert A. Cannings

Department of Environmental Biology, University of Guelph  
Guelph, Ontario N1G 2W1, CANADA

In response to the article by John Michalski (*ARGIA* 3:1) and editorial comments on *Sympetrum*, I have this to add: As many DSA members may know, I had been planning to revise *Sympetrum* (the entire

genus) for my PhD. This was the case until I decided, after much anguish, to work on my other love, robber flies (Diptera:Asilidae). Anyway, the comments in the March issue by John and Carl have brought back my guilt over the abandonment of odonatology, and especially *Sympetrum*! Will Dennis Paulson ever forgive me? Dennis?... Dennis?... Actually, even though I will be thrashing around, deep in the mire of Dipteran phylogenetic systematics, I'll still be hard at work on several dragonfly projects. An outline of the status and distribution of Yukon dragonflies is now in press, co-authored by my brothers Syd and Dick. This is the basis for a chapter on dragonflies in an upcoming book on the insect fauna of the Yukon, published by the Biological Survey of Canada. Syd and I are also working on an overview of the dragonflies of peatlands of the Canadian cordillera. Two larval descriptions are in the works- *Leucorrhinia patricia* (with Syd Cannings) and *Williamsonia fletcheri* (with Ralph Charlton). Also, the paper by me and Rosser Garrison describing a new *Sympetrum* from Mexico and Arizona will be out very soon in the *ESA Annals*.

Which brings me back to *Sympetrum*. Despite the obvious need for a revision of the genus, a big but worthwhile job, I don't know of anyone willing to take it on. I'd like to tackle it someday, assuming someone doesn't beat me to it. Whoever does it should try to incorporate molecular systematics into the work, and be certain to treat the whole genus. Ling Chu Tai's thesis (1967), done at Purdue and available from University Microfilms International, Ann Arbor, is useful but hardly comprehensive, and deals only with North American species. It can hardly be termed a generic revision. In the meantime, there are a number of nice problems for energetic souls, as noted in the March ARGIA.

Unfortunately, I can't help those readers stumped by the relationship between *Sympetrum internum* and *S. rubicundulum* - it's a problem I have never studied. The same is true for *S. pallipes* and the potential for confusion there. I can say, however, that the species Rosser and I have described from Mexico is one of the most distinctive in the New World and not related to *S. pallipes*. Rather, it is in a different species group and is closely related to *S. vicinum*. It bears a striking brown patch at the base of each hindwing and has an almost concolorous thorax and unmarked legs.

For those interested in following the travels of DSA members, I have moved from Canada's west coast to Guelph, Ontario. I have a two-year educational leave from my job at the Royal British Columbia Museum and will be at Guelph until August 1993. I'll be studying systematics of the robber fly genus *Lasiopogon* (can anyone send specimens?!). Please address mail for the present to my address indicated at the heading of this article.

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11th SIO SYMPOSIUM HELD IN TREVI, ITALY

Virginia A. Carpenter

The Nature Conservancy, Rhode Island Field Office
205 Governor Street, Providence, RI 02906, USA

The 11th International Symposium of Odonatology, which was held in Trevi, Italy, took place during the 20th anniversary of the founding of Societas Internationalis Odonatology. Over 80 people from 24 nations attended, though there were just a handful from the U.S. Trevi is an ancient town, with many structures dating to the 13th century. Like so many towns in this part of Italy, it is perched atop a hillside in the mountainous Umbrian region. This area is the heart of olive (as in oil) and grape (as in wine!) country. Other crops which dominated the landscape included tobacco and sunflower. The latter are grown in Italy, not for the birds (of which there are very few), but for the oil. It seems that even in Italy, olive oil is expensive to produce.

Scientific sessions were held at the Convent in Trevi. Due to the low number of papers presented at the sessions, two collecting trips took place, both to lakes in the area. Collecting was interesting, since so much of what was seen were new encounters for the collectors from outside of Europe. Although relatively few species were encountered, those of us from the States were delighted to learn several new odonates (the photo I made of Sid Dunkle shows his gleeful expression upon holding a first-ever capture!). The weather was very hot, sunny and dry, and August is apparently not the best season in this part of Europe for odonates. Those species which were collected included *Ischnura elegans*, *Cercion lindeni*, *Anax parthenope*, *A. imperator*, *Crocothemis erythraea*, *Erythromma viridulum*, and *Orthetrum cancellatum*.

Scientific sessions were informative and well-received. During the Symposium, it was decided that the 1993 meeting would take place in Osaka, Japan. We were all treated to a beautiful video and music to lure us to the far east in 1993.

Two local festivals were organized around our presence in Trevi. One was a dance festival and the other a cake festival (Yes, a cake festival!). For the cake festival, families brought cakes to the town square to be tasted and judged. I have never seen so many gooey, rich desserts at one place in my life! Some cakes were so large that two people were needed to move them from table to table. Rumor has it that some odonatologists consumed six or more pieces of cake that night!

Dr. Carlo Utzeri, organizer and host of the 11th Symposium, did a wonderful job coordinating field trips and scientific sessions, and making all of us feel at home in a country where we did not know the language. It was truly a wonderful experience to visit Italy, and a pleasure to see many familiar faces from past Symposia and meet new people attending their first Symposium of Odonatology.

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## A LATE SUMMER COLLECTING TRIP TO TEXAS

Jerrell J. Daigle

2166 Kimberley Lane, Tallahassee, FL 32301, USA

In September, I took a trip to central Texas expressly to look for a new species of *Argia* being described by Rosser Garrison. Unfortunately it was not present at its two known localities at the time I visited. However, I found lots of beautiful habitat where it must occur in the spring and early summer. I am convinced that if someone travels from Leakey (Real County) to Medina (Bandera County) on Texas Road 337, he or she will encounter the *Argia*. I recommend stopping at Little Dry Frio, West Sabinal River, Evans Creek, and Ephraim Creek, but especially Evans Creek on road #337.

The trip was, however, very gratifying from the standpoint of other interesting species taken: *Argia barretti*, *Protoneura cara*, *Neoneura aaroni*, *Enallagma praevarum*, *Erpetogomphus designatus*, *Libellula comanche*, *L. croceipennis*, *Macromia annulata*, and around San Antonio, *Stylurus plagiatus*. A very good spot to collect *Neoneura aaroni* was at Plum Creek on Hwy. 90 about 3.5 miles east of Luling in Caldwell County. But the banks are steep, muddy, and slippery, so be careful! *Anax junius* was swarming all week long from the Rio Grande to Corpus Christi. Stunned adults were piled up along Interstate 10. I have never seen so many *Anax junius* before! Maybe next year the *Argia* new species will be as thick!

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CURRENT PROBLEMS IN *SYMPETRUM* AND *LIBELLULA* (a.k.a. *PLATHEMIS*)

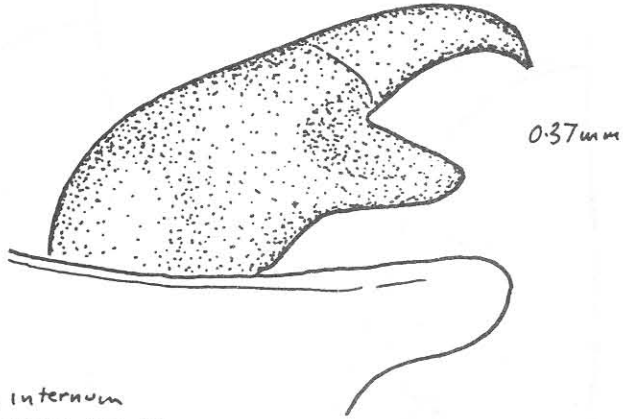
Thomas W. Donnelly

2091 Partridge Lane, Binghamton, NY 13903, USA

1) PROBLEMS IN THE GENUS *SYMPETRUM*

The *Sympetrum internum* group (*S. internum*, *rubicundulum*, *obtrusum*, *pallipes*, *ambiguum*). I have been examining specimens of this group for some time, with my main interest being northeastern species (the first three listed). All of us have long since recognized that Williamson's statement that a cherry-red face distinguished *decisum* (renamed *internum* later by Montgomery) was untrue for much of the range of that species. Eastern specimens have dirty brownish white faces, and Wyoming specimens are not convincingly much redder. But most people concede that the three species are valid. It has been suggested that there are several entities lurking under the name *internum*, but the resolution of that problem is not my intent.

For some time I have puzzled over the insect which is figured in the accompanying illustrations. I now consider it a possible hybrid between *internum* and *obtrusum*. My reason for taking this seemingly bold step is that I received for examination two males from Middlesex Co. NJ (from Mike May) that I think are probably the same thing. In southern New York *internum* is abundant and *obtrusum* is rare. My theory is that the occasional stray *obtrusum* wanders into *internum* country and is seized and mated. The offspring will be the hybrid, and it is

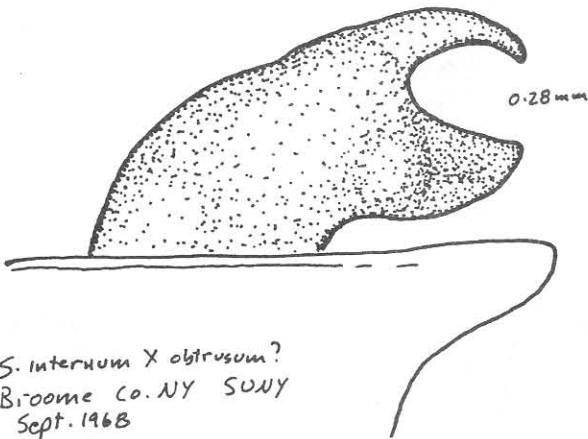


0.37 mm

S. internum
Broome Co NY
SUNY
1 July 73



S. internum
Broome Co NY July 73

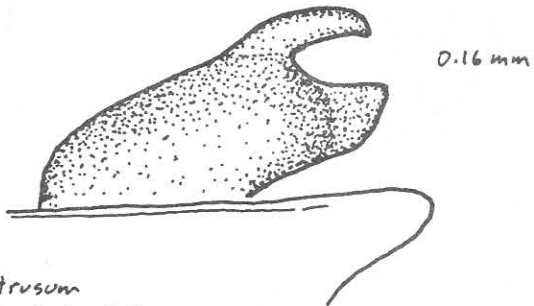


0.28 mm

S. internum X *obtrusum*?
Broome Co. NY SUNY
Sept. 1968



S. internum X *obtrusum*?
Broome Co. NY SUNY
sept 68

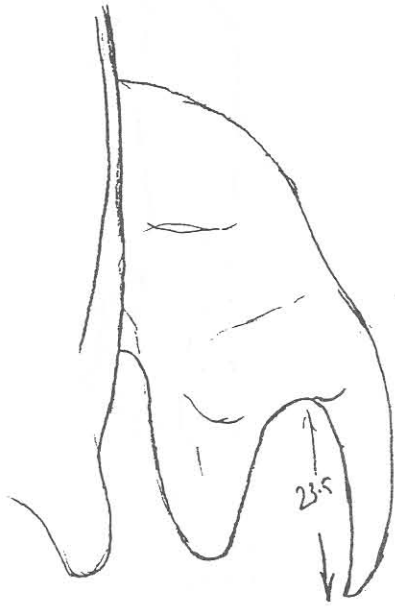


0.16 mm

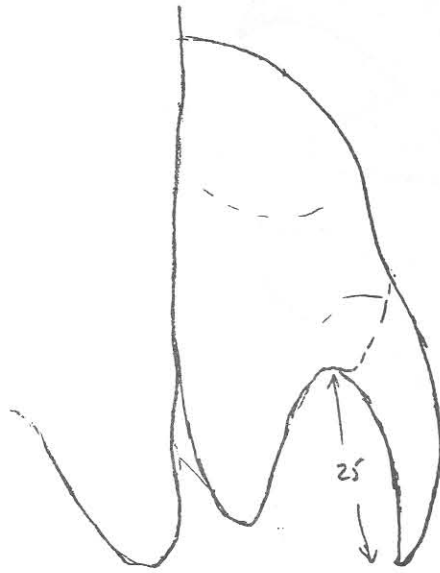
S. obtrusum
Somerset Co. ME
1 Aug 1959



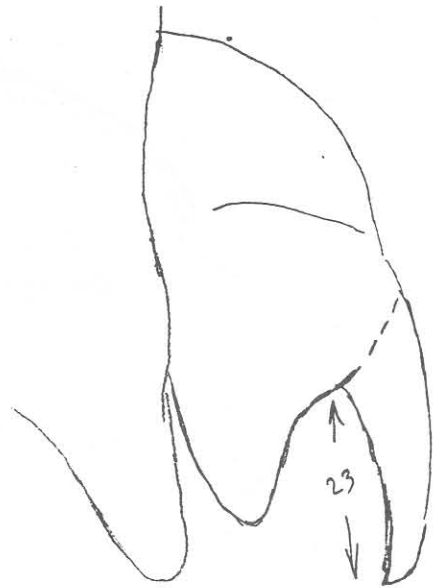
S. obtrusum
Somerset Co ME
1 Aug. 1959



147 mm
S. rubicundulum
 Penikese I. MA
 20 July 54



150 mm
Sym. rubicundulum
 Bear Meadows
 19 July 53



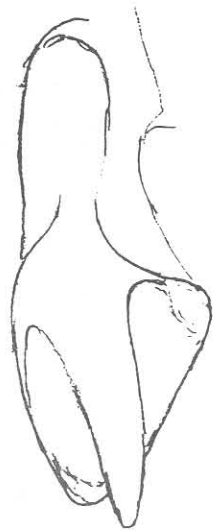
146 mm
Sym. rubicundulum
 Carapax RW



S. rubicundulum
 Penikese I MA
 20 July 54



Sym. rubicundulum
 Bear Meadows
 19 July 53



Sym.
rubicundulum
 W Va

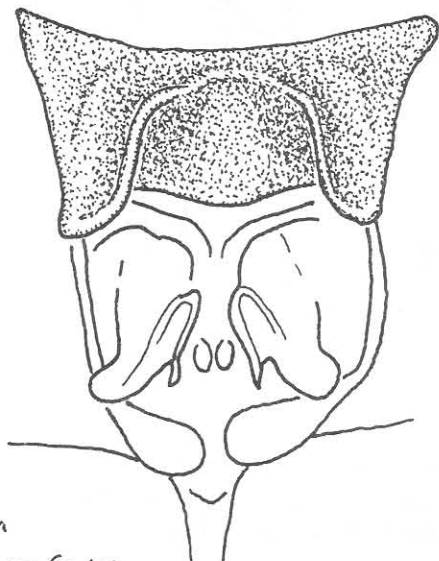
not impossible to find several together the next year after the event. It would be far less probable to catch the stray *obtrusum*. I have also taken *internum* and *obtrusum* in tandem (not in New York), and I suspect many of you have also.

I would like you to consider the possibility of a hybrid. My sketches (pp. 18-19) of the three specimens do not do full justice to the intermediate nature of the lateral bulge of the hamule of the "hybrid", but the idea is otherwise fairly well presented. The "hybrid" has the dirty face of *internum*.

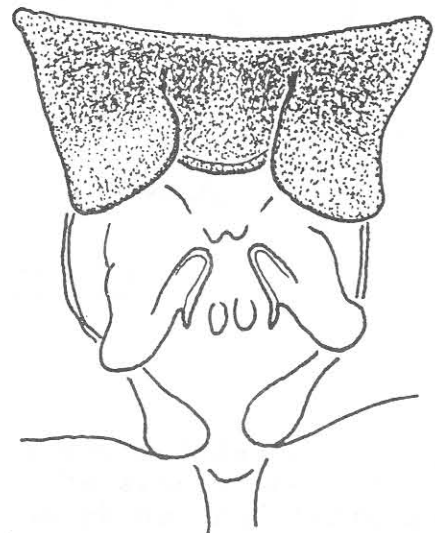
I would appreciate it if you would look into your collections to see if you have odd specimens tucked away, either of these two species, or of *rubicundulum*, which is another interest. I am pursuing the possibility of hybrids between *internum* and *rubicundulum*, but as of this moment I have no convincing cases. What I do have is more uniformity in *rubicundulum* than I had previously thought, plus its spotty but widespread distribution north of Maryland. Many specimens labeled "*rubicundulum*" sent to me are, in my opinion, *internum*, but I am keeping an open mind on this. Besides the figured characters, *rubicundulum* generally has the basal portion of the hind femur somewhat pale, esp. on the dorsum, whereas *internum* has the hind femur uniformly black.

1) PROBLEMS IN THE GENUS *LIBELLULA*

A funny thing happened when I curated a box of *Libellula lydia* recently. I have collected perilously few of these bugs - I think it is the most commonly observed, yet least commonly collected species of odonate in the US! I am now paying for my sins. I have a few specimens from New York to Virginia, and one male from Texas. Then there is this male from California (Kennedy's old locality at Napa, by the way) that is causing all the trouble...



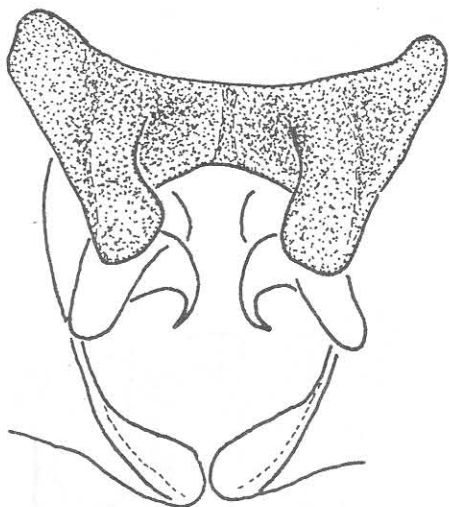
L. lydia
Broome Co. NY



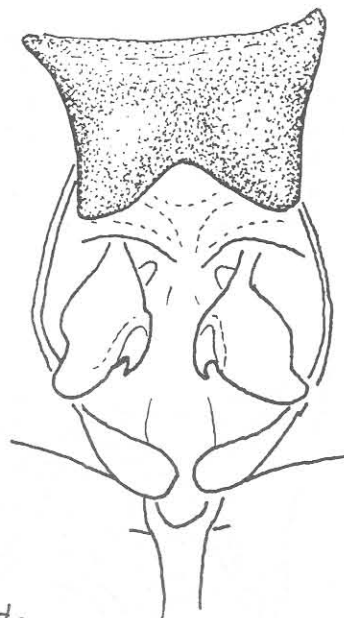
L. lydia
Napa Co. CA

For some time I have puzzled over the insect figured over leaf, I first noticed the wing markings of the Napa male were just a shade pale for *lydia*, and I thought of *subornata*, which I have from southern California and Nevada. The forked process on segment 1 is entirely different, but this process on the Napa specimen is also different from eastern specimens of *lydia*. The rami of the process are broad in the California specimen - about the same width as the gap between them. In eastern specimens (also Texas) the gap is about two to three times the width of each ramus. Rosser Garrison has sent me several more California specimens, and they are all the same as my original one.

I would appreciate it if you would look over your specimens, especially any from the western US, to see if yours fall into these two groups, or if possibly you have intermediates. It is possible that there is a distinct western species, but it is also possible that there is a gradation. At any rate, I think it may be an interesting problem. I am now kicking myself for watching several frolic around my legs when I was out at the Olympic Peninsula this summer visiting with Dennis Paulson. Again, If you can loan me a few specimens, I would appreciate it.



L. depressa
Karlsruhe, Germany



L. subornata
Lander Co. NV

The sketch above also includes a figure of the segment 1 abdominal forked process of *Libellula depressa* for consideration by those of you still bent on using *Plathemis* as a separate genus name

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OHIO DRAGONFLY SURVEY PRODUCES INTERESTING OBSERVATIONS:  
"Stinging Dragonflies" and Migrating Swarms

Robert C. Glotzhofer

Ohio Historical Society, 1982 Velma Avenue, Columbus, OH 43211, USA

A group of over 40 volunteers have just completed their first year of collecting in the "Ohio Dragonfly Survey." The survey is being coordinated through the Ohio Historical Society, and supported by a grant from the Ohio Division Wildlife's Non-Game Income Tax Check-off Fund. While we are pleased with the data we are beginning to generate, perhaps some of the most interesting results to date have come to us from other knowledgeable workers who are familiar with what we are trying to do. Two reports may be of special interest to the readers of ARGIA.

Carl Cook reported several interesting accounts of "injury" (both fact and fancy) attributed to Odonata in the December 15, 1990 issue of ARGIA. Mac Albin, a skilled naturalist with the Columbus Metro Parks, recently reported the following incident to me. On August 30, 1991, Mac was "noodling" for mussels in shallow waters along the edge of Big Darby Creek. The Big Darby is the last free flowing stream in central Ohio, it provides habitat for numerous rare species of fish and mussels, and has been named by the Nature Conservancy as one of the "Last Great Places" in Ohio. Mac was standing still, with his well tanned arms in the water feeling for mussels. As he did this, a large dragonfly landed on his arm. Intrigued by all forms of life, Mac remained still and watched as the dragonfly next attempted to oviposit in his arm. The female made what Mac described as a triangular slit in his arm, which felt like a pin-prick. While not in great pain, this was a bit much for Mac, and he brushed it off before it could insert an egg. Three or four minutes later the same incident was repeated. Mac described the dragonfly as brownish, with brown tinged wings; large, but not as large as a green darner.

The description fits *Boyeria vinosa*, which I have seen and collected in the Big Darby, and oviposits in roots overhanging the stream. One might assume this female made no distinction between exposed tree roots or branches and the tanned, motionless arm. While the observation fits Carl Cook's comments about lending credence to folklore about the dragonfly's ability to sting, it should be noted that Mac felt no severe "sting" or lasting irritation. A person less tolerant of insects could respond somewhat hysterically to such an experience, even without real damage caused by the insect.

Another interesting observation came to me from Denis Case, who administers the Ohio Division of Wildlife's non-game management and research programs. Denis sent me two male green darners, *Anax junius*, which he collected by shooting them with a shotgun on the evening of September 14, 1991. These were taken at his rural Ross County home just minutes ahead of an advancing storm coming from the west. They were flying southward in a swarm consisting of thousands of individuals by his estimate. He described the swarm as extending from about 15 feet above the ground to as high as they could still be distinguished with the naked eye. The flight was direct and rapid for the most part, and the swarm took about 3 to 5 minutes to pass the

observer. Denis located a literature reference to a similar incident reported in Ohio Journal of Science V:58, pp.50-62, by Homer Price. The incident took place on September 6, 1952 and occurred in northwest Ohio, this swarm was also heading southward. Green darners have long been known as migrants, but such spectacular flights are well worthy of note.

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(Editor's comments: Reports of similar incidents continue to reach me after my note in ARGIA. A Park Services Ranger from North Carolina told me about an incident that happened in Nantahala Nat. Forest. Some students were on a "tube float" down a stream when a dragonfly alighted on one person's leg and "stung" her. Some discomfort, redness, and slight swelling was experienced afterward. The dragonfly was captured and proved to be *Boyeria vinosa*. On September 19th, 1991, I was called to a nearby truck-stop to examine "swarms of butterflies" that trucks had encountered on I-65. Specimens salvaged off grills and windshields proved to be *Anax junius* with just a few *Tramea lacerata*. See also Daigle's article in this issue.

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#### OVER THE TRAILS WITH THE MICHALSKI'S IN 1990

John Michalski

90 Western Avenue, Morristown, NJ 07960, USA

#### ARKANSAS:

At the end of May, 1990, Caroline and I joined the rest of the group for the Jonesboro Collectors' Gathering. At South Fork I gathered my share of *O. westfalli* as well as *G. ozarkensis*, *D. spinosus*, *G. graslinellus* and sundry others. Went with the gang to the *Argia plana* site at Ash Flat, where I was able to net several males, as well as *Stylogomphus*, etc. The following day, on the Strawberry River/Rock Creek trip, came up with several female *G. lividus*, which George Harp found interesting, as well as another *O. westfalli* and some *G. graslinellus* and *Neurocordulia xanthosoma* females. Both Caroline and myself had a great time at the gathering, as I'm sure everyone else did. Thanks again, George and Phoebe! Carl, we missed you!

#### CHINCOTEAGUE, VIRGINIA/MERCHANTS MILLPOND, NORTH CAROLINA:

In late May, Caroline and I accompanied some Herpetologist friends on a road trip down to Chincoteague and northern North Carolina. At the famous wildlife refuge (actually on Assateague Island), we found great swarms of *Epiaeschna heros* feeding along the "woodland trail", as well as *Libellula needhami* and I believe *auripennis* and *Ischnura ramburi* around the parking areas. When we reached Merchants Millpond State Park, in northernmost North Carolina (a tupelo-gum swamp), we found the area full of such species as *Libellula vibrans* and *Epiaeschna heros*, which we saw by canoe in the depths of the



adjoining Fullerton Swamp. Fullerton Swamp is also loaded with Cottonmouths, which was naturally a trip highlight for our Herp friends. On one tree stump, Caroline counted seven of them woven together in a great heap! Odonates found in the more open water of Merchants Millpond included *Ischnura kellicotti* (these had bright blue stigmas, unlike the ones I catch in Morris County, New Jersey), and *Enallagma dubium*, which I failed to recognize as such, and so brought only one pair home for the data. Next time I shall be ready for them. This park was a delight ( as well as very inexpensive to visit ) and we plan to go back for more great scenery and odonates before too long.

#### NEW JERSEY:

I've been collecting in my home state fairly intensively since 1981. I have three basic collecting areas, taken in a broad sense, and these are as follows: The first is the Washington Valley of Morris Township, in Morris County. The area is made up of low, rolling hills and has traditionally been used primarily for horse farming. By New Jersey's standards, it has been impacted minimally by suburban development. The major body of water is the Whippany River, a sandy-bottomed stream about 10-15 feet across and rarely more than knee-deep. All along its course it is accompanied by cold-water springs, marshes, small muddy ponds and large tracts of pin oak swamp forest. Deer are abundant, and snapping turtles reach maximum size in the muddy ponds.

The odonates on the river include *Calopteryx maculata* and *aequalis*, *Hetaerina americana*, *Argia violacea*, *Ophiogomphus aspersus*, *D. lividus* and *exilis*, *Basiaeschna janata* and *Boyeria vinosa*. The adjoining springs and swamps are home to *Epiaeschna heros* and *Cordulegaster diastatops*, as well as many libellulids and zygops such as *Lestes dryas* and *Amphiagrion saucium*. The pond species include *Enallagma hageni*, *exulans* and *traviatum*. Back in 1982, Al Barlow and I came across a huge assemblage of mature *O. aspersus*, flying in an adjoining field. There must have been scores of them, flitting out from under each footstep! We were so new to the study back then, that we didn't know how unusual this occurrence was, and we took three specimens and left the rest. They were literally "weeds" to us-- they were chasing away the valuable and rare *Libellula pulchella*'s we were after!

One of our favorite spots in this valley is a peculiar "Man-made Marsh", a body of water some ten or fifteen acres in size, which must be about seventy-five or a hundred years old, in which someone cut all the trees down at ground level, set up wood duck boxes, and built an immense, curved dirt wall to maintain a water level of about three feet. The spillway has disintegrated and the water is mostly only ankle-deep nowadays, but the odonates are superb! I suppose we regularly see 13 species of zygops and 33 of anisops in the course of the season, including *Cordulegaster diastatops*, *Somatochlora tenebrosa*, *Aeshna verticalis*, *constricta* and *umbrosa*, *Libellula vibrans*, *quadrimaculata*, *pulchella*, *incesta*, *cyanea*, *Sympetrum semicinctorum*, *internum* and *vicinum*, and on and on. My most unusual catch here was a single male *Somatochlora walshi* that I took in 1982. Never seen since.

The second area we collect in New Jersey is in the extreme northwest of the state, in Stokes State Forest. The area is part of the

Appalachian Mountains, reaching elevations of about 1800 feet. The major body of water here is the Big Flat Brook, which is just what it sounds like. Big Flat Brook is probably one of the least impacted streams in the state, and such things as *Cordulegaster maculata*, *Calopteryx amata*, *Ophiogomphus carolus* and *mainensis*, *Helocordulia uhleri*, etc., have been taken here. My personal high point this year was the taking of a male *Boyeria grafiana*, which is, I believe, a state record. Along the river's upper reaches is a large beaver pond, home to many of the usual inhabitants like *Tetragoneuria canis* and *Aeshna umbrosa*, as well as more *C. amata* and *Gomphus rogersi* just downstream. In the "mountain" lakes around the Picatinny Arsenal in Morris County, we also see *Tetragoneuria williamsoni*, *Dorocordulia libera* and *lepida*, *Cordulia shurtleffi*, *Aeshna clepsydra* and *mutata*, and *Arigomphus furcifer*, plus several interesting *Enallagma* species like *laterale*, *boreale*, *ebrium*, and *vesperum*.

No naturalist should visit New Jersey without seeing the New Jersey Pine Barrens. This justly famous area is like an island of southern coastal plain, in many ways more like Georgia or the Carolinas than like any place north of Virginia. Pitcher plants, three species of sundews, interesting mosses and the pines and white cedars share the land with pine snakes, fence swifts, Fowler's toads and tree frogs, along with several species of slider turtles. Between my wife and I, and Al Barlow, none of us made any trips to the Barrens in 1990, with the exception of a one-day trip Caroline and I made to Cape May, where we collected *Celithemis martha*, *Libellula axilena* and *Somatochlora filosa*, species that Ken Soltesz directed us to. We normally collect in several spots in Ocean County, not far from Fort Dix, where we find such species as *Libellula flavida*, *Ladona exusta* and *deplanata*, *Nannothemis bella*, *Argia bipunctulata* and *tibialis*, *Enallagma pictum*, *daeckei*, *recurvatum*, *doubledayi* and *weewa*, *Calopteryx dimidiata*, and so on. *Aeshna clepsydra* again makes its appearance here. One of my more unusual New Jersey catches in 1990 was a male and female *Ophiogomphus rupinsulensis* (my first ever), taken on separate days along the Lamington River in Somerset County. These had such reduced brown thoracic markings that they looked superficially more like *westfalli* than *rupinsulensis*.

#### NEW YORK:

Caroline and I twice took the opportunity to join some of our Odonatological cohorts to collect in New York State. In June Ken and Joyce Soltesz invited us up, along with Harold White, Nick and Ailsa Donnelly, Al Barlow and several others for a weekend of collecting and camaraderie, both of which proved superb. The locations were all in Orange County, where Ken has been taking some very interesting species. Things of special interest to me were *Ophiogomphus mainensis*, several species of *Lestes*, including *disjunctus*, which was a new one for me, and a far-flung *Ischnura prognata*, which amazed and astounded odonatists all around, representing a known range extension of some several hundred miles. In the evening, we took to boats on the lake at Ken's home. Here, we saw *Ischnura kellicotti* and *Neurocordulia*, though the latter proved too tough for most of us in the failing light!

As summer turned to autumn, we visited with Nick and Ailsa Don-

nelly, along with Ken Soltesz and Al Barlow, up in Binghamton. At Nick's beloved ponds on the SUNY campus, we took several species of *Aeshna*, including *canadensis*, *tuberculifera* and *interrupta*. On a jaunt to Marsh Pond, we took *Sympetrum internum* and *vicinum*, *Leucorhina frigida*, and *Aeshna canadensis* and *clepsydra*, among others. I must say that on all of these outings the company was every bit as delightful, if not more so, as the field work. Thanks again to all.

#### VIRGINIA:

Enroute to the Collectors' Gathering in Jonesboro, Caroline and I collected in Virginia and Tennessee. Our Virginia stop was at the New River near Independence (Grayson County), where, due to very high water, we did not see a thing. This site is absolutely fantastic for odonates, and in past years Al Barlow and I have taken *Macromia illinoensis*, *Hylogomphus viridifrons*, *Progomphus obscurus*, *Gomphurus vastus* & *lineatifrons* (a personal favorite), *Stylurus amnicola*, *spiniceps*, and *scudderi*, *Hagenius brevistylus*, *Dromogomphus spinosus*, *Ophiogomphus howei*, and *Neurocordulia yamaskanensis* (I think), plus various and sundry. That's all!

#### TENNESSEE:

In eastern Tennessee, we stumbled across the Morristown Fish Hatchery, where several large ponds lay in various states of drainage. We spent several hours collecting under warm and sunny conditions. The most abundant species by far was *Enallagma civile*, which we took in multitudes, at the time somehow thinking we had several different species. There were also *Lestes eurinus* flying about in tandem, as well as several of the more widespread pond species, like *Tramea carolina*, *Celithemis ornata*, *Perithemis tenera* and *Anax junius*. There was a lone male *Anax longipes* over one of the ponds, which delighted us with its aerobatics, but did not grace us by flying into our nets.

The next day on our road trip brought us to the Duck River in Marshall County. Our collecting spot was at Lillard Mill, just south of Caney Springs. Here we saw and collected *Gomphurus crassus* and also *Calopteryx angustipennis* in abundance. The *angustipennis* were at times so thick around the weeds at one's ankles, that all you had to do was swing in a "figure eight" to get five or six in the net! Also on this spur of the trip, Caroline and I stopped at Flat Creek, in complete ignorance of the fact that it was one of Ken Tennesen's type localities for *Gomphus sandrius*. We saw and collected a single male of *sandrius* this time, but we returned to both spots with Mike May the Monday after the Arkansas gathering, when we each got a few more. On that day, Mike brought us to a well-collected Tupelo-Gum swamp near the Tennessee River, where we hoped to see (and collect) *Arigomphus maxwelli*, but to no avail. Caroline did, however, succeed in capturing a male of *Cordulegaster obliqua*. Tennessee was, for us, a pure delight, and I hope to get back to that state for more of its splendid scenery and collecting.

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ALABAMA COLLECTING IN 1991

Ken Tennesen

1949 Hickory Avenue, Florence, AL 35630, USA

The 1991 dragonfly season in Alabama was one of stark contrast. Early in the year there was hardly a day when it didn't rain, and when it wasn't raining, there was a cloudburst- Rainfall amounts in April and May were three to five times above normal! Even nymph and exuviae collecting was precluded due to swollen streams and flooded areas. My first successful Alabama field trip came after returning from the DSA meeting in Grantsburg. The summer and fall seasons, however, were very cooperative, hot and many sunny days. Two new state records were added, plus over 250 new county records, two-thirds of which were Anisoptera.

Several species were collected for which only one or very few records exist for the state. These records will be discussed only briefly, as specific information is intended for the forthcoming treatment of the entire state (in collaboration with Jim Harper). One female of *Gynacantha nervosa* was captured near a light above an open stairway at 11.00 p.m. in southeast Alabama, a new state record. A male of *Dromogomphus armatus* was taken in northwest Alabama, only the second Alabama specimen known to me. *Aphylla williamsoni* appears to be fairly widespread in the southern half of the state, based on collecting efforts by Steve Krotzer and myself the past two years. This year my son Greg and I observed an interesting flight behavior that we dubbed "rain somersaulting". During a fairly heavy rain on the afternoon of Sept. 7, males and females of *A. williamsoni* were active, a few flying in the rain, but most were perched on bare twigs along the edge of Coffee County Lake. When our approach spooked perched individuals, they would fly upwards about 4 to 8 feet, twirl "head over heels" downwards (probably 1 or 2 somersaults), during which large water droplets were expelled. The dragonflies then flew high up into nearby trees. Several *Erythemis simplicicollis* also somersaulted. I wonder if anyone else has observed this behavior in these or other species.

Greg and I also collected a male and a female of *Stylurus ivae* in south Alabama, only the second Alabama county where this species has been recorded. My good fortune with somatochloras this year begin with the Wisconsin trip and continued into Alabama, as I rediscovered *S. provocans* (at two localities in northwest AL), and I also collected *S. provocans*, *S. linearis*, and *S. tenebrosa* in several counties. Many libellulid records were obtained, the most notable of which follow for some species uncommon in Alabama: *Brachymesia gravida* at a pond in Lowndes Co.; *Celithemis verna* at a catfish farm pond in Colbert Co.; *Orthemis ferruginea* at a mud hole in Houston Co.; and *Sympetrum corruptum* (in large numbers) at a waste pond in Colbert Co. I am aware of another new state for Alabama, a damselfly, this was discovered by Steve Krotzer, and he will provide details in a report he is preparing.

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### FIELD AND CABINET TECHNIQUES

New applications for the syringe: Like many of you, I have been

using a hypodermic syringe to inject specimens with acetone before soaking them. The results from this technique when compared to non-injected specimens (especially Aeshnids and Gomphids) can be as different as night and day. I say can be, because there still remains the problem of fatty oils trapped inside the specimen which may not completely evaporate in the drying process after removal from the acetone. While there are many very good methods for the drying process (e.g. using a hair dryer set on low heat, placing specimens before an air conditioner, and/or on absorbent newspapers) some can be time consuming, and too much heat can be damaging to the specimens.

The result of pockets of fatty laced acetone becoming trapped in the thorax of larger sized specimens is delayed drying, sometimes taking hours to evaporate, and very often leaving a dull greasy looking thorax on your otherwise perfectly preserved Gomphid or Aeshnid. I learned quite by accident that by reinserting the needle into the specimen and sucking the fluids out, the drying process is substantially accelerated and most non-evaporating oils are removed. The important thing is that drying occurs consistently throughout the body, negating the blotchy spots that so often develop from un-even drying. The method I use is as follows: Inject your specimens with acetone to kill, or as soon after killing as possible; soak in acetone for 24 hours as usual; remove and allow a couple of minutes in open air for the acetone to drain off and evaporate; locate the needle hole created by the original injection and reinsert the syringe (this minimizes damage to specimen); slowly draw out the plunger to suck out as much fluid as possible. You will notice the withdrawn fluid is yellow and fatty, the residues that can cause specimen discoloration. If necessary repeat the "de-injection" on other parts of the body until no more fluid can be withdrawn. Then let the specimens dry for another five or ten minutes, and admire the life-like colors!

I have tested this method on, among others, *Anax junius*, *Aeshna umbrosa*, and *A. tuberculifera*, the aeshnas in particular came out magnificent! The colors very bright and evenly preserved, and the specimens were thoroughly dried within five minutes. Humidity will obviously affect drying time of the process, as well as size of the specimen, thus a *Hagenius brevistylus* would require more drying time than a *Ophiogomphus mainensis*.

I hope this tip results in better specimen preservation for those who try it. Few things are more frustrating than painstakingly catching and preparing beautiful odonates only to have the colors blotchy and poorly preserved. Good luck and happy collecting to all!

Allen E. Barlow

**Extruding the odonate penis during preservation:** The penis is an important structure used for identification purposes in many species, in particular for most gomphids and many Zygoptera. During the preparation of specimens for preservation, if a few minutes are taken to extrude this organ from within its pocket and extend it in a favorable position for microscopic examination, the almost certain necessity to relax the specimen some time in the future for that purpose will be avoided. Following acetone or air drying, the organ is always readily positioned for best viewing.

Gerhard Jurzitza

**A better method for shipping pinned specimens:** Pinning Odonata is no longer practiced by most of us. However, all the great classical collections are pinned, and many museums have a policy against sending pinned Odonata through the mails, and those who do allow it risk having valuable specimens (e.g. types) damaged. I have been experimenting with a packing method that is demonstratively superior to any others I know about. Obtain a sheet of polystyrene-foam insulating board about 1 inch thick; cut two square pieces a little larger than the specimen (about 5" X 5" for an *Aeshna*); turn the specimen upside-down and insert the head end of the pin into one of the polystyrene blocks, push the pin into the block until dorsal surface of body and spread wings rest on the block; cut two strips of thin cardboard (such as an index card) and cover all wing surfaces right up to the thorax, tape the cardboard strips securely to the block; obtain some soft, thin, (about 1 mil thickness) polyethylene film and cover abdomen with one strip, and head with another, now cut another index card with the center cut out to fit around the specimen's body to hold the polyethylene strips in place, tape securely to block; now take second block and gouge out enough space in the center so that nothing touches the body, legs, pin labels, etc., but leave enough thickness so the point of the pin will stick into the second block; now place the two blocks firmly together, tape securely, wrap in paper or film and add a precautionary label: "FRAGILE! OPEN ONLY BY AUTHORIZED PERSONS!, From: -- -- To: ----. Package the blocks in a strong outer box surrounded by at least 2" of cushioning material.

To evaluate the method, the following tests were conducted: Eight pinned specimens of *Aeshna umbrosa* were selected to be tested. Four were prepared as described above, and four were prepared using the well-known "British Museum method" (the specimens pinned firmly into dense composition pinning bottom, abdomens "X-braced" at two points with cotton-warped pins, brace pins placed just ahead of each front wing). Both lots were placed in the same outer package filled with polystyrene "peanut" cushioning. This package was carried in my pickup truck while it was driven about 4,000 miles, and upon opening the package no damage was discernible to specimens. The package was re-closed and placed in a cloths-dryer, and tumbled for one-hour. No damage was sustained by those contained in polystyrene blocks, but all on free-standing pins lost abdomens and suffered other severe damage.

I feel confident this method is superior and much safer for shipping pinned odonates. However, please observe one caveat when borrowing material from institutions- they usually have established policy on packing methods for sending and returning specimens, do not change their methods without written permission.

Carl Cook

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40th ANNUAL MEETING OF THE NORTH AMERICAN BENTHOLOGICAL SOCIETY

Dan M. Johnson

East Tennessee State University, Johnson City TN 37614, USA

Meeting location: The University of Louisville, Louisville, Kentucky, USA. Meeting date: May 26-29, 1992. Members of NABS are

invited to participate in this year's annual meeting which is co-sponsored by the U. of L. and Murray State University, and will take place on the campus of the University of Louisville. The Plenary Session will focus on ecology and management of large river systems, and a number of special sessions and workshops will examine the ecology of several life groups.

The Odonate Ecology session will showcase contemporary research in this field. Presentations will be made on larval population regulation, complex interactions, evolutionary ecology, life-history adaptations, and larvae-to-adult transition. Oral presentations will be supplemented by a group of contiguous displays at the poster session.

A tentative list suggests there will be more than 20 "odonate ecologists" in attendance at this meeting. Eight invited papers will comprise a "Special Session" devoted to Odonate Ecology; and about a dozen Posters will be displayed as an organized group. Invited speakers and the topics of their papers are:

Craig Burnside & James Robinson (University of Texas, Arlington) The role of caudal lamellae in Zygoptera: contributions to swimming speed and an allometric analysis.

Richard Rowe (James Cook University, Australia) Agnostic behavior across a broad range of taxa.

Mark McPeck (Bowling Green State University, Ohio) Evolution of behavior in *Enallagma* vs. *Ischnura* larvae.

Brad Anholt (Queen's University, Ontario) Growth rate - mortality tradeoffs mediated by activity: consequences of sex-specific differences in *Lestes disjunctus*.

Josh Van Buskirk (North Carolina State University) Population regulation in *Aeshna juncea*.

Scott Wissinger (Allegheny College, Pennsylvania) Complex interactions among *Tramea*, *Erythemis*, and sunfish populations.

Ola Fincke (University of Oklahoma) The role of interspecific competition in organizing guilds of treehole-breeding odonates.

Martha Dunham (Brown University, Rhode Island) Determinants of territory duration in *Pachydiplax longipennis*.

Tentative list of people expected to contribute poster presentations: Rob Baker (University of Toronto, Ontario), Debra Claus-Walker (University of Kentucky), Carl Cook (Dragonfly Society of America), Eddie Dry (Southwest Missouri State University), Susan Heady & Carmen Trisler (Ohio State University), Kevin Hopper (University of Kentucky), Frank Johansson (University of Umea, Sweden), Dan Johnson (East Tennessee State University), David Kesler (Rhodes College, Tennessee), Patricia Lee (East Tennessee State University), James Robinson & Rick Allgeyer (University of Texas, Arlington).

The informal atmosphere that characterizes NABS should provide plenty of opportunity for discussion among this "critical mass" of experts. While most of the attention will be focused on the larval stage, additional posters on adult topics would be welcomed; and many DSA members would enjoy the discussions, whether they are presenting papers or not. Abstract Guidelines were published in the Fall 1991 Bulletin of the North American Benthological Society. If you don't have access to that publication, contact me at the address above (or

phone (615) 929-4359; FAX 615 929 5958) and I'll send information and forms.

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#### LITERATURE REVIEWS

Chao, Hsiu-fu, 1990. *The gomphid Dragonflies of China (Odonata: Gomphidae)* Contributions of the Biological Control Research Institute, Fujian Agriculture College, Special Publication No. 1. Available from Dr. ZHAO Jingwei, Biological Control Research Institute, Fujian Agricultural College, Fuzhou, Fujian 350002, China. Price: \$70.00 US + shipping (about \$15.00 for registered air mail). However, see the NOTICES section in this issue for special arrangements available to purchasers outside China.

This magnificent hard-bound volume of nearly 500 pages is the culmination of Prof. Chao's more than 40 years study of the Chinese Gomphidae. The first publication to give a comprehensive treatment of Chinese gomphids was J.G. Needham's *A Manual of the Dragonflies of China* published in 1930. In this, and several additional papers he published on the Chinese fauna up to 1948, Needham gave accounts for a total of 58 species and 13 genera in the family Gomphidae. In 1950-51 Chao did his PhD studies at the University of Massachusetts, and his thesis entitled "Classification of Chinese Dragonflies of the Family Gomphidae" has been this reviewer's bible of Chinese gomphids every since. The formal publication of these studies was made in *Acta Entomologica Sinica*, 1953-55 (in Chinese, unfortunately for me, but the illustrations were useful!). In these studies Chao raised the known Chinese gomphid fauna to 101 species which he placed in 26 genera, thus surpassing the Nearctic fauna for the first time.

This book, after preface, introduction, and table of contents, gives a systematic account for 146 species and subspecies, which are placed in 35 genera. Even though the main body of text is in Chinese (including the the systematic section) so much information is presented in English summaries, tables, and text figures that non-Chinese readers will find the book very user friendly. On pp. 1-6 is a systematic list of taxa arranged in families and genera (English); pp. 7-432 is a general, morphological, zoogeographical, and systematic account (Chinese); pp.433-446 is a virtually complete bibliography of the literature relating to Chinese Gomphidae (English); pp. 447-453 is a general summary (English); pp. 454-478 is a key to families, genera, and species (English); and pp. 479-483 is an alphabetical listing of scientific names used in the book (English).

New taxa introduced are: *Melligomphus* gen. nov., *Scalmogomphus* gen. nov., *Asiagomphus motuoensis*, *Stylurus erectocornis*, *S. nobilis*, *S. placidus*, *Nihonogomphus cultratus*, *N. zhejiangensis*, *Lamellogomphus tutulus*, *Melligomphus cataractus*, *Scalmogomphus falcatus*, and *Sieboldius maai*. It is theorized that: *Gomphus* and *Stylurus* are separate valid genera; *Gomphus* s.str. seemingly does not occur in China; *Shao-gomphus* is recognized as the valid genus for the *postocularis* group; *Anatogomphurus* is synonymized with *Asiaogomphus*; *Onychogomphus* s.str. is removed from the Chinese fauna, and species previously placed



therein are now divided among *Lamellogomphus*, *Nychogomphus*, and *Phaeandrogomphus*.

Watson, J.A.L., G. Theischinger, and H.M. Abbey, 1991. *The Australian Dragonflies, A guide to the Identification, Distribution and Habitats of Australian Odonata* CSIRO, Canberra, Australia. Available from CSIRO Publications, 314 Albert Street, East Melbourne, Vic. 3002, Australia. Price: \$60.00 US (+ \$10.00 shipping if air mail delivery is desired).

A hard-bound volume of 278 pages, with 24 full-page color plates. Certainly this year's most beautifully illustrated dragonfly book, and the best ever collection of color photos of Australian species. This is the first systematic treatment of the entire Australian fauna since Fraser's *Handbook of the Dragonflies of Australasia* published 31 years ago. The several new taxa described in the book are given detailed descriptions, but all others are given briefer accounts. Following Fraser's lead, the main body of systematic accounts dispenses with the customary full species descriptions in favor of detailed keys and morphological illustrations as the tools for making identifications. But it is far more than just an identification guide. With chapters on biology in general, biology relating especially to Australian species, conservation, distribution (including tabulated data for each species), a check-list of all Australian species, and a bibliography of major literature on the Australian species, it is by far the most informative book yet to appear on the Australian Odonata.

New taxa described are: *Labidiosticta* gen. nov., *Rhadinosticta* gen. nov., *Austrocnemis obscura*, *Pseudagrion jedda*, *Eurysticta coomalie*, *E. kunukurra*, *Lithosticta macra*, *Neosticta fraseri*, *Austroaeshna unicornis cooloola*, *Gynacantha nourlangie*, *Hemicordulia flava*, *H. kalliste*, *Lathrocordulia garrisoni*, and *Nannophlebia mudginberri*. All original descriptions are complete and accompanied by diagnostic morphological illustrations.

Watson, J.A.L., 1991, *The Australian Gomphidae (Odonata)*. *Invertebr. Taxon.*, 5, 289-441.

This long awaited revision of Australian gomphids addresses their systematics and nomenclature at the generic and specific levels. It is based primarily on adults, but we are promised that a descriptive treatment of larvae will appear later. The descriptions, diagnoses, and distributional data are fully given for each taxa. Figures for most of the morphological structures were prepared from scanning electron micrographs and are of exceptional clarity.

The following new taxa are introduced: *Odontogomphus* gen. nov., *O. donnellyi*, *O. longipositor*, *Ictinogomphus paulini*, *Hemigomphus atratus*, *H. cooloola*, *H. magela*, *H. theischingeri*, *Antipodogomphus dentosus*, *A. edentulus*, *Austrogomphus cornutus*, *A. divaricatus*; and the following subgen. nov. are established in the genus *Austrogomphus*: *Pleiogomphus*, *Xerogomphus*, *Zephyrogomphus*; and *Austroepigomphus* stat. nov. is made a subgenus of *Austrogomphus*.

Carl Cook

## NOTICES

**MICROSCOPES:** All makes of compound & stereomicroscopes, accessories, and optical components, new & used, sold, bought & swapped. Will buy antique instruments. Write or call for list of items available and prices. C & K Instruments, 469 Crailhope Road, Center, KY 42214, (phone: [502] 565-3795).

**EXCHANGE:** Wants to exchange world Odonata. Especially wants Gomphidae from everywhere. I have available at all times 1,000-1,200 species to offer. I will identify specimens for a share of the duplicates. I particularly want the very few North American species lacking in my collection: *Ophiogomphus edmondo*, *Somatochlora brevicincta* & *septentrionalis*; males of *Coenagrion angulatum*, *Macromia margarita* & *rickeri*; and female of *Gomphurus lynnae*. Carl Cook, 469 Crailhope Road, Center, KY 42214.

**EXCHANGE:** Wants 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* & *georgiana*. 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:** Wants to exchange Odonata specimens and color slides. Offers specimens and slides of European Odonata, also slides on other subjects- birds, alpine plants, orchids, etc. Especially wants exchanges with countries such as Thailand, Sri Lanka, Madagascar, Mexico and Venezuela. Henning Pedersen, Sct. Mogens Gade 56, 2. th., 8800 Viborg, DENMARK.

**WANTED:** Urgently need information concerning the location of the holotype female of *Neurocordulia clara* Muttkowski. I would also like to examine any odd or strange specimens of *Neurocordulia* from Alabama,

Arkansas, Georgia, Louisiana, Mississippi, Tennessee and the Florida western pan-handle area. Carl Cook, 469 Crailhope Rd., 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

**BOOKS:** The two volumes *Dragonflies of Florida, Bermuda and the Bahamas* and *Damselflies of Florida, Bermuda and the Bahamas* by Sidney W. Dunkle are still available in limited numbers. Scientific Publishers, P.O. Box 15718, Gainesville, FL 32604.

**BOOKS:** *Catalogue of the family-group, genus-group and species-group names of the Odonata of the World*, by Charles A. Bridges (US \$105.00 in North America, US \$110.00 elsewhere), is available directly from the author at: 502 W. Main Street, #308, Urbana, IL 61801.

**BOOKS:** For persons outside the Peoples Republic of China, special arrangements have been set up for buying *The gomphid Dragonflies of China*. My son, Jing Zhang Zhao, is a student at the University of Kentucky, his address is: 122 Waller Ave., Lexington, KY 40503. If orders for the book are sent to him, payment may be made by checks drawn on US banks, or money order, thus avoiding bank transfer charges and other problems inherent with sending money directly to China. I am anxious to open banking relations in the US in order to purchase books and supplies there in US dollars. The price is \$70.00 + \$15.00 shipping cost via registered air mail. Thank you kindly for your cooperation. Hsiu-fu CHAO.

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MEMBERSHIP LIST OF THE DRAGONFLY SOCIETY OF AMERICA

ABBOTT, John, Briarwood, Apt. 161, 1201 Harvey Rd., College Station, TX 77840
ALRUTZ, Robert W., 1 Sunset Hill, Granville, OH 43023
AMJAD, Hassan, 12 Hummingbird Lane, Beckley, WV 25801
ANDERSON, Myron, Gustavus Adolphus College, Saint Peter, MN 5682
ANGULO, Karen, US EPA, Office of Pesticide Programs, EFED (H7507 C), 401 M Street SW, Washington, DC 20460
ARTUS, Scott, 2136 Liberty Drive, Fort Collins, CO 80521
AYCOCK, James F., 5490 Stirling Road, Davie, FL 33314
BACHAND, Yves, 566 A Chevein Beauvoir, Canton de Brovepton, QUE JOB 1H0, CANADA
BAKER, James H., 2011 Singleton, Huston, TX 77008
BARLOW, Allen E., Jr., 411B Passaic Street, Hackensack, NJ 07601
BARTEN, Jo, 3152 Wachna Drive, Windsor, ONT N8T 1Z8, CANADA
BELSHE, John F., Biology Department, Central Missouri State Univ., Warrensburg, MO 64093
BETSCH, M.O., Black Rhino Vegetarian Society, Rt 3, Box 292, American Beach, FL 32034
BICK, GEORGE H., 1928 SW 48th Avenue, Gainesville, FL 32608

BILYJ, Bohdan, Freshwater Institute, 501 University Crescent,
 Winnipeg, MAN R3T 2N6, CANADA
 BONDY, Peter, 12633 Riverside Drive E, Tecumseh, Ont N8N 1A7, CANADA
 BORKIN, Susan S., Milwaukee Public Museum, 800 W Wells Street,
 Milwaukee, WI 53233
 BOWLES, Robert L., 374 Grenville Ave., Orillia, ONT L3V 7P7, CANADA
 BRAID, Malcolm R., Station 6460, Biology/Geology, University of
 Montevallo, Montevallo, AL 35115
 BRIDGES, Charles A., 502 W. Main, Apt. 308, Urbana, IL 61801
 BRITISH MUSEUM, Acquisitions Section, Department of Library Services,
 Cromwell Road, London SW7 5BD, UNITED KINGDOM
 BRUNELLE, Paul-Michael, 2391 Hunter street, Halifax, NS B3K 4VF,
 CANADA
 CANNINGS, Robert A., Dept. Environmental Biology, University of
 Guelph, Guelph, ONT N1G 2W1, CANADA
 CANNANGS, Sydney G., 2650 Arbutus Road, Victoria, BC V8N 1W5, CANADA
 CARMICHAEL, George R., 28 Jasmine Road, Levittown, PA 19056
 CARPENTER, Virginia, 37 Arthur Avenue # 9, East Providence, RI 02914
 CASHATT, Everett D., Illinois State Museum (Zoology), 1920 10-1/2
 Street, Springfield, IL 62703
 CHAO, Hsiu-fu, Biological Control Research Inst., Fujian Agriculture
 College, Fuzhou, Fujian 350002, CHINA
 COOK, Carl, 469 Crailhope Road, Center, KY 42214
 CORBET, Philip S., 29 Mentone Terrace (1F), Edinburgh EH9 2DF,
 UNITED KINGDOM
 CORDOBA A., Alejandro, Instituto de Ecologia, A.C., AP 63,
 Km. 2.5 Antigua Carretera a Coatepec, 91000 Xalapa, Ver., MEXICO
 CUYLER, R. Duncan., 3706 N. Garrett Road, Durham, NC 27707
 DAIGLE, Jerrell J., 2166 Kimberley Lane, Tallahassee, FL 32301
 DEMARMELS, Jurg., Inst. Zool. Agricola, Fac. Agronomia UCV,
 Maracay 2101-A, VENEZUELA
 DONNELLY, Thomas W., 2091 Partridge Lane, Binghamton, NY 13903
 DUNKLE, Sidney W. Biology Dept., Collin Co. Comm. College, Spring
 Creek Campus, 2800 E Spring Creek Parkway, Plano, TX 75074
 EVANS, Mary Alice Dept. of Entomology, Colorado State University,
 Fort Collins, CO 80523
 FLINT, Oliver S., Jr., Entomology - Stop 105, National Museum of
 Natural History, Washington, DC 20560
 GARRISON, Rosser W., 1030 Fondale Street, Azusa, CA 91702
 GLOTZHOBER, Robert, c/o Ohio Historical Society, 1982 Velma Avenue,
 Columbus, OH 43211-2497
 GORB, Stanislaw, Laboratory of Insect Physiology, Schmalhausen
 Institute of Zoology, Lenin str. 15, Kiev, UKRAINE 252601
 GONZALEZ S., Enrique, Instituto de Biologia, UNAM, Departamento de
 Zoology, Apartado Postal 70-153, C.P. 04510, Mexico, DF, MEXICO
 GRAHAM, Alan C., P.O. Box 141, South Pomfret, VT 05067
 HAHN, Kay 9480 N Fairway Drive, Milwaukee, WI 53217
 HAMALAINEN, Matti Tullilaboratoria, Tekniikantie 13, SF-02150 Espoo,
 FINLAND
 HARP, George L., 606 Maplewood Terr., Jonesboro, AR 72401
 HASSKARL, Elsie M., R.D. 2, Box 10, West Brittleboro, VT 05301
 HEADY, Susan E., Department of Entomology, OARDC-Ohio State
 University, 1680 Madison Avenue, Wooster, OH 44691
 HELD, Jean R., 639 West End Avenue, New York, NY 10025
 HELLEBUYCK, Victor, 1277 Lincoln, Sherbrooke, QUE J1H 2H8, CANADA

HERMAN, T.B., Biology Department, Acadia University, Wolfville,
NS BOP 1X0, CANADA

HILTON, Donald F.J., Dept. of Biological Sciences, Bishop's
University, Lennoxville, QUE J1H 1Z7, CANADA

HOLZBACH, John E., 229 Maywood Drive, Youngstown, OH 44512

HONIG, Robert A., 3794 Syracuse, Houston, TX 77005

HOFFMANN, Joachim, Univ. Nacional Mayor de San Marcos, Museo de
Historia Natural, Av. Arenales 1256 - Apartado 14, Lima - 14, PERU

HUBBARD, John H., 6947 Nolen Circle, Cincinnati, OH 45227

HUTCHINGS, Gord E., 9775 5th Street, Sidney, BC V8L 2X4, CANADA

IHSSEN, Geraldo R., Heisterkamp 18, D2000 Hamburg-63, GERMANY

JAVOREK, Jeff R., 903 S. Cty. Trunk Hwy. X, Mosinee, WI 54455

JOHNSON, Dan M., Department of Biological Sciences, East Tennessee
State University, Johnson City, TN 37614

JURZITZA, Gerhard, Reinmuthstr. 27, Karlsruhe 21, DW 7500 GERMANY

KAUER, Kim O., P.O. Box 143, Mtn. Rest, SC 29664

KIAUTA, Bastiaan, P.O. Box 256, 3720 AG Bilthoven, THE NETHERLANDS

KOCH, Leroy M., 222 E. Olive, Palmyra, MO 63461

KOENIG, Walter D., Hastings Natural History Res., 38601 E. Carmel
Valley, CA 93924

KONDRATIEFF, B.C., Dept. of Entomology, Colorado State University,
Fort Collins, CO 80523

KROTZER, Mary J., 2105-A Montreat Pkwy., Birmingham, AL 35216

KROTZER, R. Stephen, 2105-A Montreat Pkwy., Birmingham, AL 35216

KUDLACZ, Elizabeth, 4156 Georgetown Road, Cincinnati, OH 45236

LANGDON, Keith, 2769 McCarter Lane, Sevierville, TN 37862

LEMIEUX, Jacques, 1448 rue Evangeline, Sherbrooke, QUE J1H 5Z2,
CANADA

LERNER, William, 3104 W. Strathmore Ave., Baltimore, MD 21215

MACHET, Philippe, 65 Bd de la Republique, F-92210 Saint-Cloud, FRANCE

MAUFFRAY, William F., 3426 Pasadena Drive, Baton Rouge, LA 70814

MAY, Michael L., Dept. of Entomology, Cook College, Rutgers Univ.,
P.O. Box 231, New Brunswick, NJ 0890326

MCKAY, Chris, 6969 W. St. Rt. 55, Ludlaw Falls, OH 45339

MCPEEK, Mark, Dept. of Biological Sciences, Bowling Green State
University, Bowling Green, OH 43403-0212

MICHALSKI, Caroline, 90 Western Avenue, Morristown, NJ 07960

MICHALSKI, John, 90 Western Avenue, Morristown, NJ 07960

MILLER, Kelly B., 2314 Bennett Avenue, Glenwood Springs, CO 81601

MITCHELL, Donna, Rt. 1, Box 164-2, Montrose, WV 26283

MOODY, Dwight, University of Findlay, 1000 North Main Street, Findlay,
OH 45840-3695

NEDBORNE, Ira, 1793 Riverside Drive, New York, NY 10034

NICHOLS, Barry S., 7004 Ethan Allen Way, Louisville, KY 40272

NOVELO G., Rodolfo, Instituto Ecologia, A.C., Km 2.5, Antigua
Carretera a Coatepec, A.P. 63, 91000 Xalapa, Veracruz, MEXICO

NOWAK, Mariette, 5998 Sycamore Street, Greendale, WI 53129

OLSVIK, Hans, N-6598 Foldfjorden, NORWAY

ORR, Richard L., 14015 Bramble Lane T-1, Laurel, MD 20708

PADELDFORD, Barbara, 1405 Little John Road, Bellevue, NE 68005

PAULSON, Dennis R., Slater Museum of Natural History, University
of Puget Sound, Tacoma, WA 98416

PEDERSEN, Henning Sct. Mogens Gade 56, 2.th., Viborg 8800, DENMARK

PHILLIPS, Alice H., 1383 Delia Avenue, Akron, OH 44320

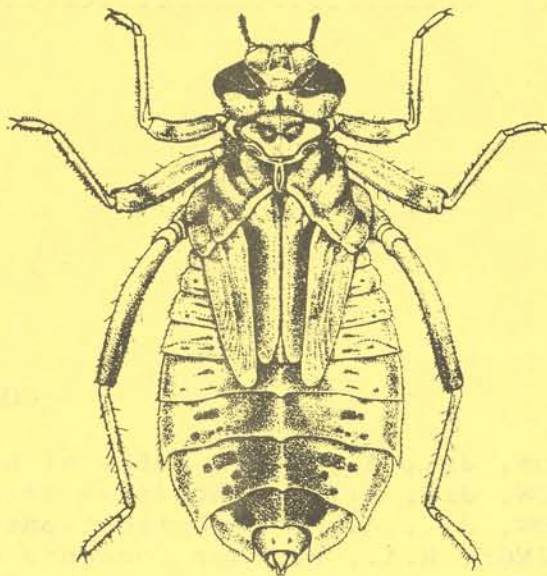
PILON, Jean-Guy, Dept. Sciences Biologiques, Universite'de Montreal,
Montreal, QUE H3C 3J7, CANADA

PIPPENGER, Mark, 6108 Kenwood, Little Rock, AR 72207
 PIPER, Werner, Unnastrasse 6, D-2000 Hamburg 20, GERMANY
 PRATT, Paul D., 7100 Matchette Road, LaSalle, ONT N9C 2S3, CANADA
 PRITCHARD, Gordon, Biological Sciences, University of Calgary,
 Calgary, ALB T2N 1N4, CANADA
 PRITYKINA, L.N., Paleontological Institute, Academy of Sciences,
 Profsoyuznaya 123, Moscow 117868, RUSSIA
 REIFSNYDER, Amy Lynn, P.O. Box 1594, Kingston, RI 02881
 RENARD, Paul, 500 Lafayette Road, Box 25, St Paul, MN 55155-402527
 RESTIFO, Robert A., Vector-borne Disease Unit, P.O. Box 2568,
 Columbus, OH 43216-2568
 ROSCHE, Richard C., 501 Shelton Street, Chadron, NE 69337
 ROSSMAN, Douglas, 1796 Strafford Drive, Baton Rouge, LA 70810
 ROSSMAN, Sharon, 1796 Strafford Drive, Baton Rouge, LA 70810
 ROWSE, R. Nicholas, 3611 21st Avenue South, Minneapolis, MN 55407
 SALA, Frank P., 3493 Greenfield Place, Carmel, CA 93923
 SCHMUDE, Kurt L., 403 East Street, Richland Center, WI 53581
 SHIFFER, Clark, 254 S. Gill, State College, PA 16801
 SMITH, William, Wisconsin Dept. Nat. Resources, Bureau of Endangered
 Resources, GEF2, ER-4, Madison, WI 53707
 SMOLKA, George E., 8910 Porter Ct., Crown Point, IN 46307
 SOLTESZ, Ken, P.O. Box 62, South Salem, NY 10590
 STORM, Douglas G., 850 NW River Shores Blvd., Stuart, FL 34994
 STORRS, Carol, 779 Barrett's Mill Rd., Concord, MA 01742
 TENNESSEN, Kenneth, 1949 Hickory Avenue, Florence, AL 35630
 THEISCHINGER, G., 20 Leawarra Street, Engadine, NSW 2233, AUSTRALIA
 TRAIL, Linden, 600 Denninghoff Rd., Columbia, MO 65203
 TSUDA, Shigeru, 7-17 Habikigaoka 7-chome, Habikino-shi, Osaka Pref.,
 583 JAPAN
 VALLEY, Steven A., 1165 SW Lawrence, Albany, OR 97321
 VAN TOL, Jan, Rijksmuseum van Natuurlijk Hist., Postbus 9517,
 2300RA Leiden, THE NETHERLANDS
 VICK, Graham S., "Crossfields", Little London, Basingstike, Hants,
 RG26 SET, UNITED KINGDOM
 VOGT, Tim, Wisconsin Dept. Nat. Resources, Bureau of Endangered
 Resources, Madison, WI 53707
 VOORHEES, Frank Ray, c/o Department of Biology, Central Missouri
 State University, Warrensburg, MO 64093
 WALKER, Dave, RR #4, Durham, ONT NOG 1R0, CANADA
 WATSON, J.A.L., CSIRO Division of Entomology, P.O. Box 1700, Canberra
 City, ACT 2601, AUSTRALIA
 WEBER, John, Jr., 3309 S. 48 Avenue, Omaha, NE 68106-4005
 WESTFALL, Minter, Jr., Department of Zoology, University of Florida,
 Gainesville, FL 32611
 WHITE, Hal, 103 Radcliffe Drive, Newark, DE 19711
 WIGLE, Michael, Box 643, Bella Coola, BC V0T 1C0, CANADA
 WIKER, James R., R.R. #2, Box 31, Athens, IL 62613
 WILLIAMS, Logan, North Carolina Dept. of Agriculture, Plant Protection
 Section, P.O. Box 27647, Raleigh, NC 27611
 WILSON, Barbara L., Rt. #1, Box 41, Hastings, IA 51540
 ZLOTY, Jack, Dept. of Biology, Univ. of Calgary, 2500 University
 Drive NW, Calgary, ALB 2TN 1N4, CANADA
 ZYLA, John D., 4430 Lakeview Drive, Temple Hills, MD 20748

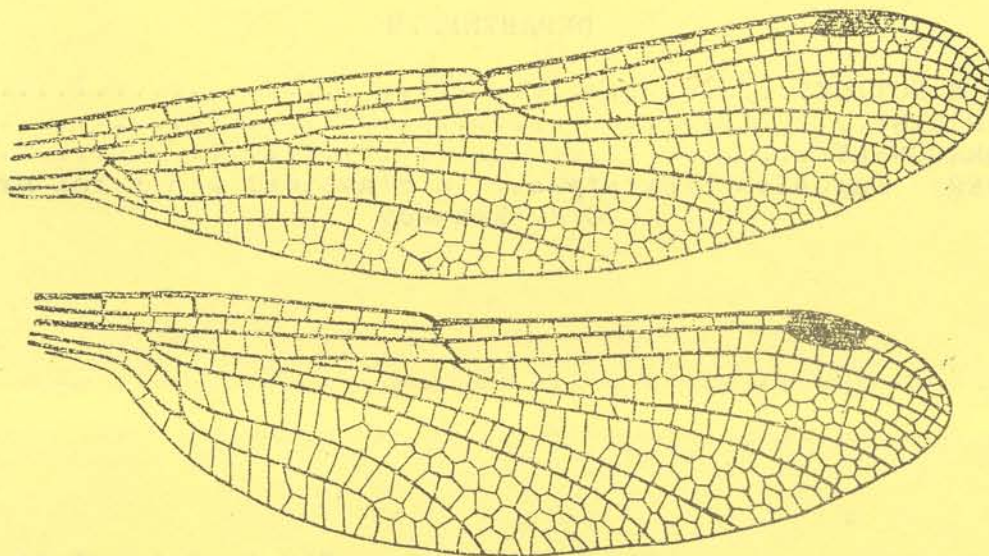
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## THE "MYSTERY DRAGONFLY" PUZZLE

The gomphid larva at right is *Lindenia tetraphylla* Van der Linden. It belongs to the subfamily Ictinogomphinae (or the Lindeniinae of some authors). It ranges through southern Europe, northern Africa, Arabia, and western Asia to Afghanistan. A rather wide-spread, but seldom encountered species in the field or in collections. No one correctly identified it from the figure in September's issue of ARGIA



The species depicted below is probably equally obscure to most of us. Few of us will ever have encountered the living animal, or be fortunate enough to have a specimen of it in our collections, but it's unique morphology and illustrations in so many dragonfly books should make it's identification dead easy. Who wants to go first?



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