FLY TIMES

APRIL, 1989 - No. 2

Here it is! Our second newsletter! We appreciated hearing from a number of you; your news and some of the entomological humor are included with this issue. As stated in the first issue, we will gladly report any and all items dealing with Diptera and the animals that study them.

Heavy teaching loads, committee meetings and actually doing something about research committments all interfere, but please do let us know about new publications, projects, expeditions, meetings or whatever.

A brief note on some fuzziness included in the first issue. The Fly Times is very much a cooperative effort, with editorial responsibilities being distributed amongst four of us, namely Brian Brown (Dept. of Entomology, U. of Alberta, Edmonton), Jeff Cumming (Biosystematics Research Centre, Ottawa), Steve Marshall (Dept. of Environmental Biology, University of Guelph, Guelph, Ontario) and myself, who attempts to coordinate all efforts. All contributions should continue to be addressed to Art Borkent who is the main type, cut and paste person, as follows:

Dr. Art Borkent,
2330 - 70th St. SE,
Salmon Arm, British Columbia,
V1E 4M3, Canada.

NB - Deadline for the next issue is September 31, 1989.

NEWS

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The Second International Congress of Dipterology

This important meeting will be held in Bratislava, Czechoslovakia on August 27 - September 1, 1990. It will certainly provide an excellent opportunity to exchange information with our European colleagues and develop and renew contacts! The scientific program includes sections on systematics, morphology, genetics, behaviour, ecology, control, neurobiology, medical and veterinary entomology, pathogens, and several others. Workshops are to be organized for at least 16 families of Diptera.

First notice of these meetings and preregistration forms were recently mailed out. If interested in these meetings and in receiving the second circular, write to the secretary as follows:

Dr. L. Jedlicka,
2nd International Congress of Dipterology,
c/o Department of Zoology,
Comenius University,
Mlynska dolina,
CS-842 15 Bratislava,
Czechoslovakia.

Canadians who have not received the first circular and preregistration forms may receive a copy from Dr. G.C.D. Griffiths at the following address:

Dr. G.C.D. Griffiths,
Dept. of Entomology,
University of Alberta,
Edmonton, Alberta,
T6G 2E3.

In addtion, proposals for hosting the 3rd Congress (1994) may be addressed to Graham Griffiths at the above address, in his capacity as Chairman of the Council for International Congresses of Dipterology.

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1989 Biting Fly Workshop

This important workshop will be held June 19-21 at Castleton State College, Castleton, Vermont, with arrival on June 18.

The program includes a presentation on the use of cuticular hydrocarbons for the identification of various taxa (by David Carlson, USDA, Gainesville, Florida) and a tabanid identification workshop.

One of the field trips planned is to a bog, with a horse boarding facility located nearby.

If you would like further information send a letter of enquiry to or phone:

Dr. J.V. Freeman,
Biting Fly Workshop,
Dept. of Natural Science,
Castleton State College,
Castleton, Vermont,
05735, USA.

(802) 468-5611 (ext. 238)

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The VII International Congress of Parasitology

These meetings will be held in Paris on Aug. 20-24, 1990, and will include many who are working on biting and parasitic Diptera. Symposia include molecular biology and genetics; cellular biology in parasites; taxonomy, evolution and life cycles; pathogenic mechanisms, pathology and therapeutics; immunology in parasitology; host-parasite populations biology and epidemiology; metabolic disorders in human and animal parasitic infections; diagnosis methods in parasitology; pharmacology, metabolism and other chemical aspects of

parasiticide drugs; vectors of parasitic diseases and their control. In addition, there are to be a variety of workshops

For further information contact the Administrative Secretariat at the following address:

Convergences,
ICOPA VII,
16, rue Jean-Jacques Rousseau,
75001 Paris, France.

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First Annual Meeting of North American Dipterists Society!

Dipterists from all over North America are attending (or have attended, depending on when this newletter gets to you!) our first annual meeting, held at the Archbold Biological Station, Lake Placid, Florida on April 15-18, 1989. We'll give you a full report of the happenings there in our next newsletter!! Here's some further info about the meetings from Steve Marshall:

Most of you will by now have received the tentative program mailed out on Valentine's day. It looks like the meeting will be well attended and informative (not to mention fun!). If you are coming, make sure you fill out the Archbold Station Application for Research Workers, skipping the research summary and instead indicating that you are coming for the Dip Soc meeting. This is necessary both to arrange accommodation on the station and for insurance/record purposes. The modest station fees are to be paid while at the station. The station is just south of Lake Placid. If you are not coming by car, you could come by train to Sebring and phone the station at 465-2571 in the hopes that some fellow dipterist will drive the 20 miles or so to get you (I'll be there with my van and would be pleased to make a couple of runs to Sebring). There will also be several dipterists driving down from Gainesville, so a lift could probably be arranged. Dr. Howard Weems, at the Florida State Collection of Arthropods, should be contacted if you plan on visiting Gainesville. See you there!
(S. Marshall)

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Manual of Nearctic Diptera - Volume 3

Now in page proof and scheduled to be published in May, 1989.

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List of other Diptera Newsletters in North America with their Editors

Flyer: Dr. F.C. Thompson, Systematic Entomology Lab., USDA, NHB-168, U.S. National Museum, Washington, D.C., 20560, U.S.A. This newsletter provides information to the international community of Dipterists.

Tachinid Times: Dr. J. O'Hara, Dept. of Entomology, University of Alberta, Edmonton, Alberta, T6G 2E3, Canada.

Ceratopogonidae Information Exchange: Dr. J.R. Linley, Florida Medical Entomology Laboratory, 200 9th Street S.E., Vero Beach, Florida, 32962, USA.

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THE CENTER FOR INSECT IDENTIFICATION IS LOOKING FOR ADDITIONAL DIPTERA SYSTEMATISTS

The Center for Insect Identification is a new business that is involved with providing identifications of, and information on, insects and other terrestrial arthropods. This is accomplished by the cooperation of many systematic specialists who have agreed to make determinations on a sub-contract basis for the Center. At the present time, over 150 systematists have agreed to provide identifications for the Center, including many Dipterists. The Center is presently able to offer determinations of the following families of Diptera:

Tipulidae; Blephariceridae; Dixidae; Chaoboridae; Culicidae; Ceratopogonidae; Simuliidae; Sciaridae; Xylophagidae; Xylomyidae; Pelecorhynchidae; Tabanidae; Rhagionidae; Therevidae; Scenopinidae; Apioceridae; Mydidae; Asilidae; Leptogastridae; Acroceridae; Bombyliidae; Empididae; Dolichopodidae; Phoridae; Micropezidae; Otitidae; Platystomatidae; Tephritidae; Sepsidae; Sciomyzidae; Sphaeroceridae; Ephydridae; Agromyzidae; Anthomyiidae; Muscidae; Calliphoridae; Sarcophagidae; Tachinidae.

If you would be interested in providing determinations (on a fee basis) for a family not listed above, or in being an additional resource for one or more of those families listed above, or in some additional information, contact: Gregory A. Dahlem, Director; The Center for Insect Identification; P.O. Box 26245; Lansing, MI 48909; U.S.A.

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A Diptera Expedition to Ecuador - by B.V. Brown

Actually, this was more like a phorid expedition to Ecuador, which I undertook in 1987 with three fellow entomologists. It was my first trip to the tropics and hopefully the experiences I had will aid others in their travels.

For anyone visiting Ecuador, there are three vital publications: the well known "South American Handbook", "Ecuador and the Galapagos Islands: a travel survival kit" by Rob Rachowiecki (Lonely Planet Publications, PO Box 2001a, Berkeley, CA 94704, USA) and, most importantly, Peck & Peck 1980, A guide to some natural history field localities in Ecuador (Studies on the Neotropical Fauna and Environment, 15: 35-55). These three publications got us started, but there was much we were to learn in addition.

Our first stop was the well known Rio Palenque Science Center, on the Pacific side of the Andes. At an elevation of about 150 m, this site is

classified as tropical wet forest. This small (approximately 100 ha) forest remnant has the most diverse plant life recorded for a single locality on earth, and there is a well illustrated flora for the property. We had good collecting at Rio Palenque, and I did collect some myrmecophilous Phoridae from army ant colonies. The diversity of phorids in my Malaise traps was also impressive, although there were no truly spectacular new things. The unfortunate problem with Rio Palenque is that it is a tiny island of forest in a sea of agriculture, and its isolation has doubtlessly caused the extinction of many species. For instance, work in the Brazilian Amazon has shown that colonies of *Eciton burchelli* (the species of army ants with the most myrmecophiles) need about 30 ha each to maintain themselves. Thus the primary forest at Rio Palenque can accommodate only 3 colonies of this ant. Although they may also be able to use some of the adjacent oil palm plantations as well, the ants would doubtlessly find less prey there. With so few ant colonies available, the associated phorid fauna is also likely to be impoverished.

Our second location was Tinalandia, a site famous among bird watchers. While the property at Tinalandia has some primary forest (at about 800 m elevation) we were more interested in the higher forests that bird watchers traditionally walked to from Tinalandia, in order to see umbrella birds. We made three trips to these higher forests, but they were reduced to small remnants which were being actively cleared while we collected in them. I doubt if they are extant today. Nevertheless, we did get some good specimens there as well. Ironically, my best collecting at Tinalandia was on the windows in the golf clubhouse, where I collected hundreds of phorids including some rarely collected ant parasites (such as the second known specimen of *Styletta crocea*).

Our third site, on the other (Amazonian) side of the Andes, was the town of Baeza. Again this locality had only small montane forest remnants and second growth within walking distance. The same can be said for our final destination, Tena, located in the Amazonian lowlands. We did get a break, however, when we met some gold miners at our hotel. They took us too a more remote area and allowed us to collect in the primary forests that were nearby.

We traveled by taxi and local buses. One thing we quickly learned was without a rental car (which were expensive), the chances of getting to good forests are slim. Therefore, to dipterists wishing to visit Ecuador in the future I would make the following recommendations:

1) Visit the Rio Palenque station and collect in the last remnants of its forest.
2) Arrange to visit the field stations that are beginning to be built in protected areas, such as Jatun Sacha near Tena, or the montane forest reserve north of Tinalandia, near Nanegalito. These new reserves have larger areas of forest than Rio Palenque.
3) You could try the National Parks, which are beginning to be organized. I don't know any particulars on facilities available.
4) Take a river trip down the Napo River out of Coca.
5) If you can afford the expense, rent a car.
6) You may be able to arrange to fly in to some oil rig camps in the Amazon. Some friends of mine were able to do this and were flown in and put up for free. You should make these arrangements far in advance of your trip, however.

Failing to stick to these guidelines may result in a very disappointing trip. Certainly you will not see much virgin forest or interesting fauna, unless your insects frequent second growth or edges (for instance Tinalandia has been long known as an excellent site for buttereflies). Remember that the deforestation has proceeded rapidly since the publication of the paper by the Pecks.

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Dr. Marshall R. Wheeler reports that the Diptera collection at the University of Texas at Austin has found a new home through long term loans. The Drosophilidae are being deposited in the American Museum of Natural History and the remaining acalyptrates are going to the United States National Museum in Washington D.C. He notes that it is somewhat difficult to remain retired: there are still lots of requests for help with identifications, for reprints, etc.!

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Technique Note - by S. Marshall

Label making: For years, I have been making labels by photoreducing sheets of computer produced labels. This method is quick, but not always of the highest quality. Actually, some of my old labels made on a dot matrix printer were really awful! More recently, I have been using Freelance Plus, a software program that will drive our Hewlett Packard Laserjet printer to make any size label. This method is too slow for routine label production, but makes great type labels. Chris Plowright (University of Toronto, Dept. Zoology) and Chris Darling (Royal Ontario Museum) have recently come through with a piece of software that combines the high quality of Freelance labels with the convenience of regular computer produced labels. I have been using a pre-release version which allows the quick production of multiple copies of clear, tiny labels directly on bond paper using a laser printer. Watch for the release of this program, called HPLABELS. (S. Marshall)

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Phorid Fauna of Guelph, Ontario (Diptera: Phoridae) - by B.V. Brown

The phorid fauna of several areas in the U.K. have been published by Disney, but no comparable list exists for North America. Thus, I thought it would be of interest to informally publish a list of the species of this family I collected during my stay at Guelph. The site was the U. of Guelph Arboretum, a small area that contains deciduous forest (maple, walnut, beech), conifers (cedar, hemlock in low lying areas), regenerating fields and marshland. This list represents two years worth of malaise trapping; in 1984 I ran two traps, one at the deciduous forest/ field interface and one in the deciduous forest, while in 1985 I ran the same two plus a third near the marsh.

The results of my collecting bore out Schmitz' remark that "several years of collecting" are necessary to get a good idea of the diversity of

the phorid fauna. Many species were captured in 1984, but not in 1985, and *vice versa*. Some common species and genera in 1985 were completely absent in 1984.

Detailed comments are as follows. The specimens of *Conicera* from Guelph are currently under study by Jeff Barnes and the *Phora* are being looked at by Tadao Gotô. Thus, it can be expected that there will be several species of *Phora* present, and perhaps another one or two of *Conicera*. The number of *Megaselia* species is a bare minimum, as I have examined in detail only the specimens of "Group VII" in my material (Schmitz divided this genus into 8 informal "Groups"). I estimate there will be 120-180 species of *Megaselia* from this site alone, many of which are undescribed. I separated the species based on the male genitalia, which has shown that "species" identified using Borgmeier's key (which uses characters of the setation, wing venation, etc.) are often groups of 5 or more species.

An interesting omission is that I collected no *Gymnophora luteiventris* Schmitz here, a species common in a smaller wood lot about 2 km away.

In British sites, the diversity of phorids has run as high as 50 species, nowhere near the number found here. This is probably because of the relatively impoverished nature of the British fauna (Disney has found that there are "only" about 220 species of *Megaselia* in Britain), as well as the fact that long term trapping, of the type I did, was not used in the British studies.

Total: at least 107 (perhaps 250) species in 23 genera from University of Guelph Arboretum.

Aenigmatias coloradensis (Brues)
Aenigmatias nigricornis Borgmeier
Anevrina luggeri (Aldrich)
Anevrina macateei (Malloch)
Anevrina olympiae (Aldrich)
Anevrina spinipes (Coquillett)
Anevrina thoracica (Meigen)
Apocephalus coquilletti Malloch
Apocephalus mortifer Borgmeier
Apocephalus similis Malloch or *A. pergandei* Coquillett (the two may belong to one variable species)
Beckerina aliena Malloch
Beckerina luteola Malloch
Borophaga clavata (Loew)
Borophaga fuscipalpis Schmitz
Borophaga subsultans (Linné)
Borophaga tinctipennis Borgmeier
Chaetopleurophora atra Borgmeier
Chaetopleurophora eurythronota (Strobl)
Chaetopleurophora multiseriata (Aldrich)
Chaetopleurophora pennsylvanica (Malloch)
Chaetopleurophora rubricornis Borgmeier
Conicera barberi (Malloch)
Conicera dauci Meigen
Conicera pauxilla Schmitz
Crinophleba vitrinervis (Malloch)
Diplonevra funebris (Meigen)

Diplonevra nitidula (Meigen)
Dohrniphora incisuralis (Loew)
Dohrniphora perplexa (Brues)
Hypocera ehrmanni Aldrich
Lecanocerus compressiceps Borgmeier
Megaselia Rondani (at least 57 spp., perhaps 200)
Metopina Macquart (at least 2 spp.)
Phalacrotophora epeirae (Brues)
Phalacrotophora longifrons (Brues)
Phora Latreille (several spp.)
Puliciphora Dahl (at least 2 spp.)
Rhyncophoromyia conica (Malloch)
Spiniphora excisa (Becker)
Spiniphora slossonae (Malloch)
Spiniphora spinulosa (Malloch)
Styletta camponoti Brown
Triphleba aequalis Schmitz
Triphleba bispinosa (Malloch)
Triphleba lugubris (Meigen)
Triphleba subfusca (Malloch)
Triphleba sulcata Borgmeier
Triphleba sp 1
Triphleba sp 2

Needless to say, there are many undescribed and poorly understood taxa in this sample. Collections from Alberta, where I am now studying, are less diverse and will be reported in a future issue of "Fly Times".

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TIPS ON PINNING SARCOPHAGIDAE SPECIMENS

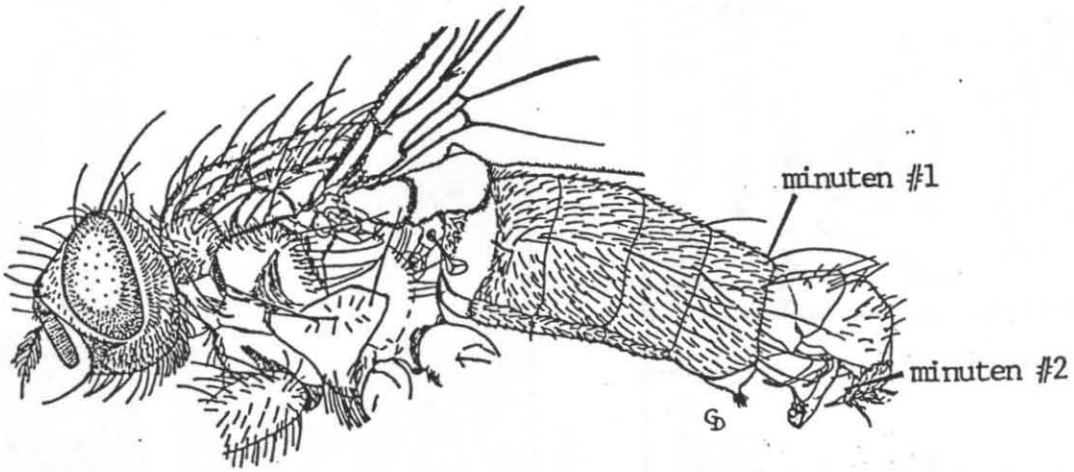
Gregory A. Dahlem

My recent research on the sarcophagid genus Ravinia has pointed out a real need for increased awareness by the collecting community on proper mounting techniques for sarcophagid specimens. Less than 60 seconds time is needed for a collector to properly mount a fresh specimen, and this often saves 20 minutes/specimen time in the specific identification process (the time it takes to dissect out and clear the genitalia). Monty Wood has suggested that these same techniques would also be applicable to tachinid specimens.

Sarcophagid specimens should be killed in a cyanide bottle, or other types of kill jars, and should not be preserved in alcohol. Alcohol collected specimens are often a bit distorted and their genitalia are nearly impossible to spread. Specimens collected in a Malaise trap, or other traps where Lepidoptera can be found, should be quickly rinsed off in a stream of water from the sink faucet. The use of a handkerchief makes sure that no specimens wash down the drain. This is especially important for female specimens where Lepidoptera scales often clump and stick on the genital sternites. The specimens should be washed or sprayed, not soaked. Fresh specimens are pretty tough, and should not break up or discolor from a quick washing.

All sarcophagids should be pinned through the thorax. Very few, if any, Nearctic species are too small for a 0 sized pin. This makes it much easier to spread the genitalia or remove the abdomen when genitalia dissection is necessary. It is often very difficult to remove abdomens from point mounted and minuten mounted specimens. If small pins are not available, glue the side of the thorax directly to the pin. Most sarcophagids pull their legs up when they die. This can obscure details of the legs, thorax, and abdomen. Gently pull down the legs of specimens after pinning, grabbing the tibia with forceps is the easiest way to do this without damaging the specimen. This can be done very quickly, and no lifelike pose is necessary. Losing a leg here and there is preferable to not being able to see the thorax and abdominal sternites.

The last, and most important, procedure is spreading the male genitalia. The only specialized equipment that this takes is styrofoam (I use 2" X 4" blocks of ¼" styrofoam) and some minutens. The male specimen is placed on its side and the pin is stuck into the foam at the smallest possible acute angle which allows for good holding. One minuten is placed dorsally above the abdomen, just anterior to the genital capsule. The second minuten is used to tease out the genitalia by placing it on the interior margin of the cerci and pulling the cerci out posteriorly until they are roughly at a right angle to the abdomen. This will allow the aedeagus to extend ventrally. This technique is best done under a scope and takes very little time with just a little bit of practice. Let the specimen dry a day or two, and you will have a very nicely mounted specimen that can often be identified by a non-specialist.



The male genitalia is often so distinctive that a species identification can be made by matching up the genitalia with a text figure. The best atlas of male genitalia of Sarcophagidae remains J.M. Aldrich (1916) Sarcophaga and allies. Thomas Say Foundation Vol. 1. 302 pp.+ 16 pls. More current generic and species names can be found in the Catalog of the Diptera of America North of Mexico. One special note about Aldrich's work, Oxysarcodexia ventricosa (Wulp) is one of the most commonly collected species of Sarcophagidae, but the genitalia figure in Aldrich was erroniously labeled Sarcophaga assidua Walker. Another good reference work (in terms of good genitalia figures) is S.S. Roback (1954) The evolution and taxonomy of the Sarcophaginae (Diptera, Sarcophagidae). Ill. Biol. Monog. 23(3/4): v + 181.

redacted Far Side, 7/24/1988

sent by Bill Wirth

PHROGG

Savannah News-Press, Sunday, April 8, 1984 — 7E

sent by Dan Hagan

Collecting in Venezuela - a report by Steve Marshall

I appreciated Brian Brown's comments on Costa Rica in the first issue of fly times, and would like to offer some more comments on neotropical collecting. First of all, though, I would like to "editorialize" in pointing out that Brian's name was inadvertently left off the list of editors/organizers of Fly Times on our first issue. That first issue was put out in a necessary rush, since we had to give adequate notice of the Archbold Meeting. That rush resulted in some embarrassing typos, and some unfortunate omissions. To set the record straight on the history and organization of Fly Times, I would like to point out that an earlier newsletter called Fly Times was produced several years ago by Brian Brown and myself, and forwarded to Monty Wood for emendation and distribution. Shortly thereafter, Monty learned that Chris Thompson was about to initiate a newsletter, to be called the Flyer, so he suggested we abandon Fly Times and essentially donate its contents to Chris's effort. We did so, and we continue to support Chris's international newsletter (the Flyer), but during discussions at the International Congress of Entomology at Vancouver, Brian, Art Borkent, Jeff Cumming and I agreed that a North American newsletter was necessary. Brian and I guaranteed regular support and input, Art agreed to take on the big job of putting it all together, and Jeff agreed to handle the duplication and mailing. Personally, I was extremely pleased with the final product (despite the typos!) and sincerely hope that it will have the continued support of the dipterological community.

Now, on with collecting! Merida, Venezuela is one of the most congenial, productive, and generally ideal places I have ever visited on a collecting trip, and I highly recommend it. Tourist charters to Venezuela are cheap (mine cost $499CDN to Barcelona), and you can fly anywhere within the country for less than 40$, so getting to Merida is easy and economical. It is in a narrow valley, so pilots don't consider it easy to get into, but that shouldn't bother you. I had to fly in twice on consecutive days before the cloud cover allowed a landing, and that landing was pretty spectacular. Once you are there, you can stay in a first class hotel for less than 10$ per night, and hire a cab and driver for about 20$ per day. Rental cars are readily available, but cabs are cheaper, even over long trips of several days. The immediate Merida area is fantastic collecting. An excellent trail starts right at the end of Calle Sta. Rosa, near the University. Go literally to the end of the road, walk around the gate and follow the trail until it hits a creek and degenerates into a footpath through secondary forest. In about a half hour's walk, at about 2000m, you will hit some of the finest undisturbed forest in the area and you will stay in constantly changing, fantastic forest until the trail reaches paramo, 3 or 4 hours up the trail. If you don't like walking, and your permits are in order, the other side of the valley sports the longest cablecar in the world. You can get off at each station, note the elevation conveniently written on the station wall, and hit the trails that connect the cablecar stations. This area is all national park, so a permit is required. The main national parks office in Caracas has never answered my letters, in Spanish or English, and the local parks office in Merida refused to give me a permit. If you want permits, I suggest starting your trip to Venezuela with a couple of days of personal paper chasing in Caracas.

My main expeditions out of Merida were to local paramos, a remote paramo near Mucuchies, and the road to LaAzulita. The most accessible local paramo is LaCulata, where a 40 minute cab ride will drop you at the end of a road which degenerates into a trail leading directly (10 minutes) into classic, albeit grazed, paramo. We accessed better paramo by taking a cab to Mucuchies where we hired several mules and horses and a local Indian to take us on a two day trip

to an alpine lake. The price was right (a few dollars per person) and the collecting was superb but it was cold. The road to LaAzulita, which many tourists travel to go to the picturesque village of Jaji, leads through excellent lower elevation forests, ending in the rather remote town of LaAzulita at about 1000m. The road is in bad repair beyond Jaji, and taxi drivers demand extra to do it, but the forests near LaAzulita are extraordinary. If you like caves, there are some large caves (previously a tourist attraction, but long since abandoned) in LaAzulita. These easily accessed caves are full of huge whipscorpions, but seemed to me to be dipterologically depauperate ... no phorids and no sphaerocerids. This was in marked contrast to the Humboldt Caves at Caripe. I had collected good series of several species on Oilbird refuse piles in the Humboldt Caves a week or so earlier. Caripe, by the way, is a pleasant place to visit, but was very poor collecting outside the cave. Things would probably be different during late May or June.

My experience in the rest of Venezuela is minimal. I had planned on collecting in the dry forests of the northeast on the same trip as I visited Merida, but last April was so dry that I spent a week there without getting anything of merit. I plan to return later in the rainy season. I also plan on returning to Venezuela to collect in the Maracay area and perhaps on the Gran Sabana. Any advice? (S. Marshall)

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Books and Publications

Ferrar, P., 1987. A guide to the breeding habits and immature stages of Diptera Cyclorrhapha. Entomonograph 8 (Vol. 1,2). Vol.1 with pp. 1-478, 73 tables, 8 figs., Vol. 2 with pp. 479-907. E.J. Brill, PO Box 9000, 2300 PA Leiden, The Netherlands. $180 US. Following comment by Jeff Cumming and Brian Brown.

This impressive two part set primarily summarizes published information on the immature stages of each of the 87 families of Muscomorpha (Aschiza + Schizophora) including correlated life history and behavioral information, although some new information is included. Chapters on techniques, comparative morphology of the immature stages, breeding habits and a key to families for third instar larvae precede the family treatments that make up Part 1 . Each family chapter begins with a summary of distribution, economic importance and biology, before describing the immature stages. Part 1 ends with a massive 75 page bibliography to the copious citations throughout the text. Part 2 is a systematic arrangement of the 479 pages of figures that accompany the text. Most of these are lifted from other sources, but a few are original illustrations of specimens in the Australian National Insect Collection. (JMC)

I found the section on the Phoridae (the family of greatest interest to me) to be remarkably complete. The only biological information that I could add to Ferrar's table was that from an unpublished PH.D. thesis from the U.S.A., which Ferrar could hardly be blamed for overlooking. He also states that he knows of no phorids considered for biological control of pest insects, although a couple exist. These omissions in no way detract from the high quality of the coverage. If other families are as well covered, this

book would indeed be an indispensable reference.

The illustrations, largely redrawn from other sources are not of extremely high quality, but it would be pointless to have the text volume without them. This two volume set is highly recommended, if you can afford it! (BVB)

Jobling, B. 1987. Anatomical Drawings of Biting Flies. British Museum (Natural History) and Wellcome Trust, London. 119 pp.

Three hundred and fifty six illustrations by the late Boris Jobling, of five species of biting flies, are excellently reproduced in this work without reduction. (JMC)

Wirth, W.W. and W.L. Grogan. 1988. The Predaceous Midges of the World (Diptera: Ceratopogonidae; Tribe Ceratopogonini). Flora and Fauna Handbook No. 4. E.J. Brill, New York, xv + 160 pp., $28.95.

This comprehensive work treats all 45 genera (some new) formerly included in the Ceratopogonini and Stilobezziini and now combined under only the Ceratopgonini. A key is provided for these genera and each genus is further diagnosed, with a full set of drawings of pertinent characters, taxonomic comments and a list of included species given. A must for all ceratopogonid workers and of vital importance for those working on the systematics of the Nematocera.

Catalogue of Palaearctic Diptera. Volume 3. Ceratopogonidae - Mycetophilidae. 1988. Ed. A. Soós. 448 pp. Elsevier Science Publ., Amsterdam, Oxford, New York, Tokyo. $118.50 US.

This most recent and welcome addition to our understanding of the Palaearctic fauna includes treatment of the following families:

Ceratopogonidae, Leptoconopidae, Simuliidae, Thaumaleidae, Pachyneuridae, Bolitophilidae, Ditomyiidae, Keroplatidae, Diadocidiidae, Macroceridae, Manotidae, Mycetobiidae, Lygistorrhinidae, and Mycetophilidae. All taxa described before December 31, 1982 are listed and like the previous volumes, a complete bibliography and index is included.

If you'd like to get a copy write to Elsevier Science Publishing Co., Inc., 52, Vanderbilt Avenue, New York, New York, 10017, USA.

Catalogue of Palaearctic Diptera. Volume 8. Syrphidae - Conopidae. 1988. Ed. A. Soós. 363 pp. Elsevier Science Publ., Amsterdam, Oxford, New York, Tokyo. $208.00 US.

This volume, another contribution to the series containing the above mentioned text, includes three families: Syrphidae, Pipunculidae, and the Conopidae.

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Syrphidae in the Canadian National Collection of Insects (CNC)

J.R. Vockeroth

I will begin with a digression - an explanation why the Canadian National Collection of Insects (and of Arachnids and Nematodes) is in the Department of Agriculture rather than in the National Museum of Natural History (where the research collections of other groups of animals are housed). During the First World War it was noticed that both organizations had small insects collections and it was decided that they be combined in the Museum. Before this was done the Parliament Building in Ottawa was destroyed by fire, Parliament met in the National Museum during the rebuilding, and in order to create as much space as possible the Museum insect collections were sent to Agriculture. They have been there since that time.

The very small collection of Diptera that existed at the time of this merger was greatly increased, from 1923 to 1928, by the efforts of C.H. Curran, the first Dipterist employed by the Department of Agriculture. Most of his collecting was in eastern Canada and in Kansas. His colleagues, particularly G.S. Walley, also collected many Syrphidae during the 1920's, and much other Canadian material, particularly from British Columbia, and Manitoba was added by the applied entomologists employed by Agriculture. (I regret that so few applied entomologists of the present time follow the lead of their predecessors). The collection grew more slowly from 1928 to 1948. In 1948 two significant events occurred. G.P. Holland became the director of the Systematic Entomology Unit (now with the inclusion of botanists and mycologists, the Biosystematics Research Centre) and began to increase the staff of insect taxonomists (from eight in 1948 to about 20 in 1955 and 29 1980). At the same time the Canadian Northern Insect Survey was begun. It was a joint project of the Canadian Departments of Agriculture and Defense, and had as its primary purpose an assessment of the biting fly populations of northern Canada. Fortunately, however, the people engaged in the survey (taxonomists from Ottawa plus many students employed for the summer) were encouraged to collect insects of all orders. The result was that hundreds of thousands of arctic and subarctic insects were added to the CNC. At least half of these were Diptera, which make up perhaps half the species of insects in the subarctic and perhaps two thirds in the arctic. Unfortunately Chironomidae and Muscidae (and probably Mycetophilidae) greatly outnumber Syrphidae in the Arctic. During the late 1940's and early 1950's most of our field parties were in arctic and subarctic Canada; in later years they have also been in southern Canada, several parts of the United States, northern and southern Mexico, and Nepal. Another digression and a bit of tub-thumping in 1951 I undertook our first over seas expedition - two and a half months in Swedish Lapland (mostly at Abisko), which because of my interests at that time resulted primarily in collections of Nematocera, particularly Chironomidae and Culicidae, so that I collected only those Syrphidae that fell into my net.

During the period 1950-70 several hundred thousand Diptera, including many thousands of Syrphidae, were purchased from L. Pena, who collected in southern and western South America, and from F. Plaumann, who collected in southern Brazil. One other significant purchase of miscellaneous Diptera was

of some 35000 specimens, including over 1000 Syrphidae collected by H. Falke in Uganda and Zaire in the 1970's. In 1973 and 1981 the F.M. Hull collection of Diptera was purchased; incorporation of the 15,000 Syrphidae in this collection into the CNC is still continuing. One other collector should be mentioned. The late J.W. Boyes of McGill University, who published extensively on syrphid cytotaxonomy, deposited in the CNC his extensive collections which covered all major geographic areas except the mainland of Asia. In addition, much material, especially Palaearctic, has been obtained by exchange; this includes over 300 species (many from the U.S.S.R east of the Urals) received from the late Prof. A.A. Stackelberg.

The CNC contains specimens of over 2500 syrphid speciedwhich are either identified or segregated but unnamed. There are also many unstudied specimens, but most are sorted to genus. The total number of specimens is approximately 132,000. Coverage is best for Canada, Chile, U.S.A., and western Europe (in that order), but there are also significant collections from Mexico, Ecuador, Peru, Bolivia, northwestern Argentina, southern Brazil, Uganda and Nepal, as well as smaller collections from many other areas. Even the European part of the collection is likely to contain valuable material (see for example Dusek and Laska 1973, Description of five new European species of the genus Metasyrphus, etc., Acta ent. bohemoslov. 70:415-226). Reasonable requests for loan of material from any area for revisional studies are invited. Exchange of specimens is also desired.

The syrphid collection contains 94 holotypes of Curran species, 124 holotypes of Hull species and 32 holotypes of species described by other authors (a catalogue of Diptera types in the CNC is being prepared). There are also paratypes of many other species, especially of those described by Hull. Also present are specimens of several hundred species which I have compared with types in many European and North American collections.

The collection of immature specimens is small. It consists mostly of dry puparia associated with adults, and includes most of the puparia described by Heiss (1938), Ill. Biol. Monog. 16(4).

We are hoping to include with the next newsletter a list of all North American Dipterists, their addresses, and their main interests and areas of research. Of necessity, the description of activities will need to be very brief (the editors are susceptible to developing callosities on their fingertips!). Please restrict yourselves to no more than 20 words, listing the titles of your major projects and the animals you work with.

Such a list will hopefully be of interest to all and perhaps even result in some new cooperation with researchers with similar interests! We would therefore ask that you take a few moments to fill out the form below and send it to Dr. J. M. Cumming, Biosystematics Research Centre, Agriculture Canada, Research Branch, Ottawa, Ontario, K1A 0C6, Canada.

Should any of you like to expand on your interests and projects, feel free to send in a contribution that can be inserted into the next newsletter as a separate item.

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Full name: _____

Address: _____

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Projects and Taxa Studied: _____

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