



*Chairman: Thomas L. German*

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<i>Chairman</i>	1	Greetings from the Department of Entomology! Our last newsletter was distributed about eleven months ago after a hiatus of about five years and there were many changes to report.	Plant Pathology along with expert help from support staff is making for a smooth transition from straight research and teaching to administration. While accepting a position as department chair in these times of economic constraints is a bit daunting, the culture established during David's years as chair has laid a foundation for continuing the exciting and productive period that the Department is currently enjoying. We are the benefactors of an excellent support staff, committed faculty and a legacy of Department collegiality. To further increase the comfort zone, I asked Rick Lindroth to serve as Associate Chair and I am very pleased that he accepted and received unanimous endorsement from the faculty.
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<i>Richard Lindroth</i>	7	Dave Hogg was the top candidate in a college wide search for the position of Executive Associate Dean of CALS. He accepted the position and has been immersed in his new assignments for several weeks. While we will miss his leadership and our daily interactions, we are pleased that he is advancing his career and more than a little proud that an entomologist was chosen from the field of highly qualified candidates. Dave will retain laboratory space and a 20% research appointment to ensure that he does not become uncoupled from the real world of science or the Department. We wish him well and look forward to working with him in his new role.	The profile of faculty in the Department continues to evolve. By the end of this year we will have five Assistant professors on board. In addition to Que Lan and Chris Williamson who have been here for a while two new faculty have been hired. DeWayne Shoemaker comes to us from Western Michigan University and has taken up residence on the sixth floor as our new insect population geneticist. We are also looking forward to the arrival of Claudio Gratton in January who will be have
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<i>Que Lan</i>	13	Dave's departure necessitated the selection of a new Department Chair and I am proud to say that at our August meeting I was selected by the faculty and subsequently appointed by Dean Aberle. I am getting used to this unexpected career change fairly quickly. My experience as director of the Wisconsin Seed Potato Program and as Chair in the Department of	
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a research and teaching program in the area of insect pest landscape ecology. The search for a replacement for John Wedberg, who is enjoying his first year of retirement, is well underway. If all goes well we will have someone selected and on the job soon after the first of the year. It will be exciting to watch the careers of these new young faculty unfold. The future of entomology at Wisconsin is in their hands and things look bright! Progress is taking place at all levels as this year we made the easy decision to promote Susan Paskewitz to the rank of Full Professor.

Our undergraduate and graduate teaching programs seem to be on track as well. In the last few years enrollment in our undergraduate courses has been on the rise. Entomology 201 (survey of Entomology) taught by Walt Goodman has about 140 students this year! Our higher level introductory course taught by Dan Young, the physiology course taught by Que Lan, the insect ecology course taught by Rick Lindroth and principles of pest suppression taught by Dave Hogg and Dan Mahr (who stepped up to fill the gap created by the time demands of Dave's promotion) all have substantial numbers of students this semester. As you might expect, the type of teaching we do is changing in response to new technology. A significant improvement in our ability to utilize these resources is provided by Janet Deutsch, a new staff member who provides us with expertise in the implementation of information technology. This is an important addition to the Department as most of us do not have the time to stay on top of both teaching technology and our disciplinary content.

This year we have about 40 students enrolled in various graduate programs. They must be learning something too because for the second year in a row they were runner's up in the North Central Branch ESA Linnean games. A team consisting of Bob Ellingson (Dave Hogg), Craig Brabant (Dan Young), Nadia Krista (Dan Young) and Kerry Katovich (Dan Young) will compete in the National Contest at the annual meeting in Florida. Several graduate students in the department received prestigious fellowships over the last year. Brian Aukema (Raffa lab) was a recipient of a Thomsen Distinguished Graduate Fellowship from UW CALS. Jack Donaldson (Lindroth lab) was selected as the

department's recipient of an Assistantship, generously provided by the Novartis corporation.

Due to the generous gifts of former faculty, alumni and friends the Department is now in a position to offer two graduate fellowships to especially promising students. The "Doc" Chapman Award will provide funding for a graduate student in vegetable crop entomology. The Alex and Lillian Feir Award will provide funding for a student in biochemistry, physiology or molecular biology. The Department also activated a generous gift provided by the family of Winnifred Doanne making it possible to invite distinguished speakers to the Department to interact with faculty, staff and students and present a public seminar. The department is most grateful for the establishment of these fellowships and gifts, as they will enhance our ability to attract the best and brightest of potential graduate students to our program and enhance the scholarship of the department.

Our contributions to teaching are being recognized from without as well. This year Walt Goodman received the North Central Branch ESA teaching award which will make him eligible for the National ESA Award. In recognition for his "extraordinary efforts and dedication to both the practice and the scholarship of teaching" Walt also received the College's 2002 Spitzer Excellence in Teaching Award. We agree with their characterization of his activities and are pleased that he has been recognized by this prestigious award.

These are a few of my thoughts about the department. If you are reading this you must have some interest in the whats going on which means we have an interest in you as well. Please let us know if you have thoughts or suggestions about the department or to learn more visit our web site at:  
<http://www.entomology.wisc.edu/>.

## Thomas L. German

For the last fifteen or so years I have been interested in the relationship between plant viruses and the insects that transmit them. The most common examples of these are the viruses of vegetable and fruit crops that are transmitted by aphids. These viruses cause enormous economic loss due to yield and quality reduction of their host crops and the cost of insect control measures required for disease management. Until recently, the only serious examples of insect transmitted virus problems in Wisconsin have occurred on potatoes and sporadically on commercial vegetables and glasshouse ornamentals. However, simultaneous with an explosion of the soybean aphid that was introduced into the State in the last few years, there has been a precipitous rise in the incidence of virus diseases of both succulent beans and soybeans. To address this situation, Arne Thompson, (a Research Specialist with my program) and I are conducting a statewide survey to identify the viruses involved, determine their incidence and define their geographic distribution. To do this we identified six main growing areas from which we have taken several thousand leaf samples that we are testing in the laboratory. This year we are focusing on cucumber mosaic virus (CMV) and alfalfa mosaic virus (AMV) to make the work manageable, but we know there are other viruses involved that we will consider in the future. We are also working with colleagues Jeff Wyman in Entomology, Walt Stevenson and Craig Grau in Plant Pathology and Jim Nienhuic in Horticulture to evaluate insecticides to control virus vectors, and to identify sources of commercial cultivar and wild species resistance. Our role in that work is to test the material they have planted in field plots for the presence of virus. So far we have tested about 50,000 leaf samples and are in the process of evaluating the data. One thing that we know already is that CMV and AMV are a serious problem across most of the snap bean production areas in the State. About the only good news is that there seems to be some benefit from early plantings to avoid the late summer flush of aphids. Eventually we hope our work will lead to the development of recommendations to control the damage caused by these and other viruses on snap bean crops in the Midwest.

characterized, but equally important example of a viruses vector relationships that we study. TSWV is in a large family of viruses called the Bunyaviridae that includes important pathogens of humans, domestic animals and plants. The wide host range and corresponding economic importance of TSWV, coupled with its fascinating biology, make it interesting and significant from the perspective of the applied as well as the basic scientist. The TSWV host range includes horticultural and agronomic crops across temperate, subtropical and tropical regions of the world. A few of the affected crops include, pepper, tomato, lettuce, potato, papaya, peanut, tobacco and chrysanthemums and many of these experience losses of greater than 90%. These events have given the TSWV dubious distinction of being one of the 10 most economically destructive plant virus.

In nature, TSWV is transmitted from plant to plant by several species of thrips (Thysanoptera: Thripidae) and in the laboratory it can be transmitted mechanically. The worldwide dispersal of the Western Flower thrips (*Frankliniella occidentalis*) preceded the emergence of TSWV as a major agricultural pest in the last 15 years. The TSWV-thrips insect relationship is very specific and only eight species are able to acquire and transmit the virus. We have shown that the virus is not just passively acquired and transmitted but in fact, replicates in the tissues of the insect. Infected adults pass on the virus from one infected plant to another but interestingly; the adults must have picked up the infection during feeding in their larval stage to be an effective carrier of virus. To determine why this is true Anna Whitfield, a PhD student in my laboratory is studying the molecular interactions between the surface of the virus and the gut of both larval and adult thrips in an attempt to identify specific molecular determinants that make it possible for virus particles to move into the larval gut tissues, multiply, be passed to the adult salivary gland and ultimately transmitted to new host plants. We assume that this will involve interactions between glycoproteins on the surface of the virus and proteins in a receptor on the larval gut

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wall. So far she has cloned and expressed the relevant viral proteins and is exposing them to isolated insect tissues to map and characterize the molecular features involved in the interaction. In the long term we would like to exploit these molecular interactions to develop bio-pesticides that will target toxic materials specifically to thrips. If we can accomplish this it will address important problems caused by both thrips damage and the losses incurred from the virus. We also believe that understanding the relationship between this virus and its vector will contribute to our understanding of the biology involved in many other insect-virus relationships that create medical and social problems in many parts of the world.

This research provides an excellent vehicle for various instructional opportunities and I try and bring the results of current research to courses that I teach. The TSWV program provides ample opportunities for spin off research projects for biology students and we

## *Jeffrey Wyman*

It has been a while since we updated alumni on the vegetable entomology group at Wisconsin, but the program continues to flourish in its new home in 537 Russell.

Two really exciting developments have come to fruition in 2002 which reflect the strength that the program draws from its alumni.

Firstly, the R. K. Chapman Scholarship fund has continued to grow as donations from Chip and Betty and our alumni continue to come in. 2002 marks a significant milestone as the fund met its original goal of providing a halftime Research Assistantship and we will begin to award the R. K. Chapman Research Assistantship in Vegetable Entomology in January of 2003! This prestigious award will go a long way toward securing the future of vegetable entomology research in the state.

Secondly, a generous donation from Winifred Doane and the Doane Family in memory of Charles Doane has established a colloquium speaker fund in the

usually have one or two undergraduates in the lab. In Plant Pathology/Entomology 505 "Plant Pathogen Interactions" that I teach with Caitilyn Allen and Andrew Bent from the Plant Pathology Department, we discuss the current literature, have the students write mock grant proposals and cover the basic biology and molecular aspects of viral infection and transmission. This year I also taught a special topics course about viruses and insects. This was a great experience because it allowed me to get to know grad students in the department and we had a great time discovering that there was something in this area of interest to everyone.

This year two postdocs in my group moved on to "real" positions and Elisabeth Eyestone who was a Research Specialist and student completed her MS degree and went on to work on a PhD at Oregon State University. But the wheel keeps turning, Arne Thompson was hired to replace Elisabeth, we are recruiting to fill several postdoctoral slots and Dr. Mark Kainz from Colgate University will come to the lab on sabbatical leave in January of next year.

Department. This fund will enable us to bring in a top-flight speaker every year in Vegetable Entomology to present the Charles Doane Distinguished Lecture to our faculty, students and growers. Charles Doane (Ph.D. 1953) was one of the first Chapman students and his studies on the interactions between the onion maggot and soft rotting bacteria set the stage for many subsequent studies on the anthomyidae. To present the first Charles Doane Lecture in 2003, we are turning to one of the worlds leading authorities on the biology and management of anthomyid root maggots, Dr. Charles Eckenrode who is also a Chapman Ph.D. (1970). Chuck recently retired from Cornell University and moved to Wyoming. His Lecture which is scheduled for March 7, 2003, will bring together a synopsis of anthomyid research.

The Vegetable Lab is looking forward to these new events and we thank our distinguished alumni for making them possible.

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On the insect management front, it is fortunate that we are not judged by our ability to make problems go away permanently for our growers! It seems that the harder we work, the more questions there are to answer but we continue to make progress. We currently have five graduate students, one researcher, and one post doc on the project and to bring things up to date, I will give you a brief bio on each.

### **Jeff Wyman**

Jeff is still hanging in there after an unexpectedly rough summer of 2002 when he was diagnosed, treated and now cured of throat cancer. It was a rough summer but thanks to Pat who kept things going on the home front and a tremendous crew who kept things going at work, we were able to survive and hopefully now move on to better things. One positive outcome of this is that I lost 60 lbs and am now back to the lean, mean machine that came to the U.S.A. in 1966 (doesn't anyone play handball anymore!?). I also decided that U.S. citizenship was long overdue and became a yank in February of this year.

### **Chip Chapman**

Chip is doing great again after a few jousts with health problems. He still comes into the lab and, since two of our new projects involve aster yellows and snapbean viruses, his advice to the students is invaluable. Chip and Betty have moved from Waban Hill to Verona where Chip has faced the challenge of cramming 50 years of possessions into a house that is a third smaller, thank goodness for garage sales! They both enjoy cruises and beating the odds at the local gambling joints.

### **Jerry Longridge**

Jerry won his own battle with cancer this past year and thankfully can approach retirement in good health. The deer herd in Wisconsin is already considering a move to Minnesota! The vegetable researcher position faces a major reorganization in 2003 when it will be shared between the vegetable and field crop positions for the first time.

### **Deana Sexson**

Deana is now in her second year as a post doctoral outreach specialist working with the ever expanding eco-potato project. Her work with the industry has been tremendous and is becoming a major success story as Wisconsin growers begin marketing the country's first eco-potatoes this year.

### **Carlos Granadino**

Carlos is our senior grad student who will get his Ph.D. this winter. Carlos has worked with impacts of GMO potatoes, reduced risk pesticide regimes and using georeferencing technology to map pest populations. Carlos most recently defied protocol by falling in love and marrying Lisa Flack, a summer hourly and now a grad student in our program! It was a great wedding during which Carlos miraculously recovered from a serious volleyball injury long enough to throw away his crutches and dance only to reinjure the same foot and put himself back on crutches and miss half of the potato harvest!

### **Scott Chapman**

Scott will also be finishing up his Ph.D. this winter. He has been working on increasing biological control potential in potatoes. This summer Scott put his thesis on the back burner for a while and took on the job of honcho of the insecticidal screening programs at Arlington and Hancock. He did a great job but found that the hours seriously impaired his ability to hunt and fish. He is looking forward to returning to the "good life" of a grad student this fall--however briefly.

### **Chris Capozzi**

Chris is a Captain in the US Army who is getting an MS with us before moving on to West Point to teach. Chris arrived at the same time that a major outbreak of virus diseases in snap beans hit the state. He has done an excellent job in examining the aphid vectors and looking at ways to manage virus spread. His Army training also brings some long needed discipline to the lab!

### **Lisa Flack, now Lisa Granadino**

Lisa joined our group this year after a B.S. in Plant Pathology and a stint in the Peace Crops. She is doing an MS as part of a major carrot IPM project which ties together much of the earlier work by Chip and his students. If her ability to establish and run three major field trials with carrots while planning and bringing off her own wedding are reflections of Lisas potential, then the future holds great promise!

### **Chris Perry**

Chris is our latest addition from Santa Cruz via Seattle. He began an MS this summer studying a devastating new mite pest of peppermint which has cut the states production by more than 50 percent over the last three years. Chris is a savior since this tarsonemid mite is too small for anyone else in the group to see, let alone manage! Chris will be co-advised by Dan Mahr.

## Robert Jeanne

My students and I continue to explore the behavioral ecology of two very different groups of social wasps. We continue to investigate group dynamics in *Polybia occidentalis*, a tropical swarm-founding species. Working in Costa Rica, we recently showed that wasps in a colony-founding swarm are able to adjust their collective behavior to construct a nest of the right size to accommodate themselves and the brood they will rear. While the gross architectural plan of the nest is determined by genetically encoded building behavior, analysis of nests built by swarms of different sizes suggests that this scaling of nest size is the result of group-size-dependent dynamics. In other words, the size of the group appears to quantitatively modulate the rules of building behavior so as to produce a properly proportioned nest of the appropriate size. How the swarm members 'know' the size of the group they're in remains a mystery.

In this same species we are also investigating life history traits and the trade-offs among them. Andy Bouwma, Ph.D. student, has measured the costs of colony initiation in this species and found that about half of the original members of the founding group die by the time the colony manages to produce its first worker offspring. Small founding groups are therefore at risk of going extinct before they can rear replacements, tipping the offspring-size vs. offspring-number trade-off in favor of producing a few large swarms rather than a lot of small ones. In an exciting recent discovery, Andy found that many colonies in his study population are heavily infected with gregarines, a protistan parasite that can fill most of the adult hemocoel with oocysts. Interestingly, however, the parasite does not appear to kill the wasp. Instead, it reduces the work rate of the infected adult, leading to a paradoxical effect on the colony: the more heavily infected the workers of a colony are, the less work the colony accomplishes. Thus, heavily infected colonies have low productivity, but because worker mortality rates are directly related to foraging rates, they also have unusually low adult mortality rates.

Ken Howard recently completed the field work for his masters thesis on *P. occidentalis*. Ken found that colonies forage at rates that are strongly correlated with the biomass of brood in the nest, suggesting that foraging effort is set by the demand imposed by the

larvae. Working in collaboration with Adam Smith at the University of Washington, he was able to show that in the bizarre, nocturnal *Apoica pallens*, swarms immigrate to new nest sites in an unusual way. While *P. occidentalis* scouts scent-mark a chemical trail between the swarm and the new site, which the swarm then follows, *A. pallens* neither employs scouts nor scent trails. Instead, the entire swarm appears to hunt *en masse* for a suitable nest location, inspecting several potential sites before settling on one. Ken recently began work on his Ph.D. research, on reproductive strategies used by queens of *Leptothorax* spp., ants that can house an entire colony inside an acorn.

Our second group of projects centers on the German yellowjacket, *Vespula germanica*, a European import that has become the most abundant nuisance wasp in urban areas of the U.S. With the long-term goal of developing effective control measures, our efforts have been directed at understanding the mechanisms underlying food-finding behavior. Work in progress includes Cristie Hurd's Ph.D. investigation into individual differences in foraging behavior and how decisions are made whether to forage or not. She has accumulated an extremely extensive and detailed data set on individual foraging rates in a captive colony, which she used to address the phenomenon of 'elites.' Elites are workers in colonies of ants, bees, and wasps that work at rates that seem to be significantly higher than rates for ordinary workers. She asked whether elites are qualitatively different from other workers in terms of their work rates, or are they just at the tip of the tail of a normal distribution. Her quest took her to the raw edge of statistical and mathematical theory before she concluded in favor of the latter. She recently presented her work at a symposium in Switzerland.

We continue our work on scent-marking behavior in yellowjackets. It has been known for a long time that the burrow leading to the underground nest is marked with some sort of chemical that foragers recognize and follow. Christine Curry, an undergraduate researcher in the lab, found last year that dozens of foragers have to track the path before their nest mates can recognize it chemically, suggesting that the chemical is not a

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specialized trail pheromone. Similarly, Jenny Jandt last year showed that food sites repeatedly visited by foragers also accumulate the 'footprint scent:' newly arriving foragers preferred a heavily-visited dish of scented sugar solution over an unvisited one. She asked whether a single visit to a dish can leave enough of a scent for the next forager to recognize, and found the answer to be 'no,' that it takes close to 100 visits before foragers begin to prefer a scent-marked dish.

## *Richard Lindroth*

My research group continues to make progress in some of our traditional research areas, while also developing several new directions of research. Our work focuses on chemical mediation of ecological interactions, with an emphasis on tree-insect interactions. One major project is continuing to investigate the effects of genetic variation and resource availability on aspen chemistry, the costs of defense in aspen, and consequences for aspen-feeding insects such as gypsy moths and forest tent caterpillars. This work is being carried forward by graduate students Jack Donaldson and Michael Stevens. A second project is investigating the individual and interactive effects of high levels of atmospheric carbon dioxide (CO<sub>2</sub>) and ozone (O<sub>3</sub>) on chemical composition of aspen, birch and maple, and consequences for herbivorous insects and their parasitoids. This work has graduated from a greenhouse to a field setting, using the Free Air CO<sub>2</sub> Enrichment (FACE) facility near Rhinelander, Wisconsin. Dr. Caroline Awmack and graduate student Alycia Holtebeck Ashburn, are working on various aspects of this project. A related study, coordinated by Dr. Bill Parsons, is evaluating the consequences of CO<sub>2</sub> and O<sub>3</sub> on leaf litter decomposition and nutrient cycling at the FACE site. Finally, a relatively new area of research in the lab is a collaborative project with scientists at Northern Arizona University, investigating the ecological consequences of hybridization among various cottonwood species in riparian habitats of the western U.S.A. This multi-investigator study is evaluating the genetic structure and chemical composition of cottonwood populations, and consequences thereof for animal communities and

Now a beginning masters student, Jenny is repeating that work, this time using unscented sugar solution, to determine whether the food odor may have overridden the more subtle effect of the footprint cue.

Whereabouts of recent past students:

Karen London (Ph.D. 1998): Ethologist, *Dogs Best Friend*, Black Earth, Wisconsin

Sarah Day (M.S. 1999): Teaching high school biology, Maryland

Lee Clippard (M.S. 2002): Instructional Specialist, DoIT, UW-Madison. Designing on-line interactive tutorials that help undergraduates learn difficult concepts in biology.

nutrient cycling. Our work in this area is coordinated by Dr. Brian Rehill.

Of course, our research activity would come to a standstill without substantial funding from outside sources. Both Jack Donaldson and Michael Stevens have received prestigious fellowships for their graduate work, Jack's in the form of a Novartis Assistantship, and Michael's as an EPA STAR fellowship. We remain most appreciative of continued funding for our work from the National Science Foundation, U.S. Dept. of Energy, and U.S. Dept. of Agriculture.

In addition to research, I continue to teach Insect Ecology and coordinate a course in Ecotoxicology. Over the last several years I've also served on the NSF Ecology program panel, and as subject editor for the journal *Oecologia*.

2001 was a year of goodbyes, as graduate students Tod Osier (Ph.D.), Brian Kopper (Ph.D.), and Kim Holton (Master's) finished their degrees and moved on. This year we hope to recruit 1-2 more graduate students and a postdoc.

## *Susan Paskewitz*

The Paskewitz lab focuses on the molecular biology and biochemistry of parasite interactions with mosquitoes. The summer of 2002 was especially busy as I was involved in characterizing a large family of genes that are involved in mosquito immune responses. The work was part of the *Anopheles gambiae* genome project that was published in *Science*, October 4, 2002. Other work in the lab is also going well. We have identified several interesting proteins directly involved in melanization and killing of malaria parasites within the mosquito as well as others that mediate responses to parasites and to bacteria. Finally, we moved up to the 739 complex this year, upon the departure of Mike Strand. We are very happy in our new space and enjoy being able to work as a team in one room.

On to an update of some of the people involved in this work. Major life events have occurred for many. Yeon Soo Han received a Ph.D. in 1998 and moved to Colorado State University. This year, after completion of his postdoctoral work, he has returned to Korea. He assumes a position as assistant professor at Chungbuk National University. We wish him well. Michael Riehle graduated with a Master's degree in 1996. Mike went on to work in Mark Brown's lab at the University of Georgia and should shortly have obtained his Ph.D. I note that Mike was a first author on a recent science paper concerning mosquito neuropeptides. Good work Mike! Ashley Stancil, who received a Master's in 1999 for her work on ticks and Lyme disease, continues in the Veterinary School here in Madison. Ashley and Scott Myers, a former graduate student of John Wedberg's, were married last summer.

## *DeWayne Shoemaker*

I am a new faculty member in the Department of Entomology. My family and I relocated to Madison this past summer and we have spent the past few months adjusting to our new surroundings. So far, the transition has been very easy—we love it here! The city is fantastic and the surrounding countryside is beautiful. I also am very excited to be a faculty member in this department and university.

The main emphasis of research in my laboratory is

Congratulations! Bin Li is our newest student and is working towards his Ph.D. Bin and his wife have a new baby girl, born in September 2002. They have named her Madison, in honor of our fine city. Congratulations to Bin and family. Dr. Lei Shi joined the lab from Fudan University in China last year. He has made great progress in his studies of bacteria and malaria-induced peptides. Research specialists in the lab include Olga Andreeva (DNA work), John McMaster (protein biochemistry, computer management), and Beth Schadd (protein work, cell culture, mosquito rearing, general lab manager). We also have several talented undergraduates who are working on various projects. These include Amanda Crim (2 D gel electrophoresis), Andrea Radtke (cell proliferation assays) and Ellie Walker (inducible responses in cell cultures).

Interestingly, all of these undergraduates took Entomology 201 with me. This class, Insects and Human Culture, has shown steady and strong increases in enrollment and we received additional financial support from the College this year in recognition of this growth. Walter Goodman also teaches a section, so Ent 201 is offered both semesters every year. The 201 students very much enjoy the insect rearing project and the waggle dances performed by the instructors each year. I also teach Medical Entomology every other Fall semester. This year, the class has an enrollment of 31 (although the lab only seats 24) so I have had to do some dancing to make it work out. But the students seem to be happy and I am finding it rewarding as always.

population and evolutionary genetics. A long-term goal of my research is to contribute to the understanding of the evolutionary, ecological, and historical processes responsible for the patterns of diversity observed in nature, a central concern to evolutionary biology. Several current areas of research include: population

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genetics of introduced and native fire ants; molecular systematics of fire ants; and the evolutionary interactions of *Wolbachia* microbes and their insect hosts, using native fire ants, *Drosophila*, and New World tropical fig wasps as model systems

While I currently do not have any graduate students in my laboratory, I do have two students actively pursuing research at Western Michigan University. Also, I finally have gotten my laboratory fully equipped and am beginning to generate data for several projects. One student currently at WMU is Kevin McAbee. He is trying to complete laboratory work for his Master's thesis. His work focuses on the effects of *Wolbachia* on mitochondrial DNA (mtDNA) variation and evolution. For his project, he is sequencing the entire mtDNA genomes from multiple individuals of two closely related *Drosophila* species, only one of which harbors *Wolbachia*. This comparative genomics approach has never been applied directly to studies of the effects of *Wolbachia* on host mtDNA evolution.

Another student at WMU is Mike Ahrens. He is an undergraduate and currently is working on two different projects. For his Honor's thesis, Mike developed and

used molecular markers to infer the phylogenetic relationships among a group of solitary euminine wasps. His other project is part of a larger, ongoing project aimed at determining the distribution and effects of *Wolbachia* on the fire ant *S. invicta*. This latter project also involves a substantial amount of DNA sequencing and, as a result, I have had sufficient opportunity to get to know the staff in the University of Wisconsin Biotechnology Center. Mike's future plans are to come to Madison this summer and start graduate studies toward a Master's degree in my laboratory. He will continue his work on *Wolbachia* in fire ants for his Master's thesis.

In addition to Mike arriving in June, there will be a postdoctoral researcher coming to my laboratory in April. Franck Dedeine currently is pursuing his Ph.D. at Université Claude Bernard–Lyon 1 in France under the supervision of Michel Boulétreau. He is studying the effects of *Wolbachia* on the wasp *Asobara tabida*. Franck recently published a paper showing that this wasp requires *Wolbachia* for oogenesis and that wasps lacking the bacteria were completely sterile. Franck will continue his studies of *Wolbachia* in my laboratory. His project will focus on the effects of *Wolbachia* on host fitness and reproduction using fig wasps as a model system.

## R. Chris Williamson

From a tenure perspective, I have been here just over one year. However, prior to being offered an assistant professor position in July 2001, I began as academic staff personnel in December 1998 with responsibilities in the area of turfgrass, ornamental, greenhouse, and Christmas tree insects. Although my commodity groups are quite broadly reaching, much of my research is focused in the turfgrass arena.

To date, I have four graduate students, all but one are working on turfgrass entomology related projects. My first student as a university academician, Allison Walston, is putting the finishing touches on her M.S. thesis. Currently, she is gainfully employed as a research technician at Oregon State University. Two other graduate students, Steve Hong and Tyler Eaton will be completing their M.S. degrees in early 2003, both are working on turfgrass entomology projects. The most recent addition to my lab is Tina Johnson, she

began her M.S. program in September 2002. Tina will be working on an ornamental entomology project involving the biology and management of the linden borer, an important insect pest of nurseries and urban landscapes. Finally, I have accepted my first Ph.D. student, I have asked Steve Hong to stay in my lab and continue his studies.

As far as management of important turfgrass, ornamental, greenhouse, and Christmas tree insects goes, it seems that there are not enough hours in the day or days in the week to address the plethora of questions and problems that exist. Important insect pests such as Japanese beetle, gypsy moth, and linden borer, just to name a few, continue to provide opportunities for research and funding. Subsequently, my lab will diligently work to attempt to make progress in solving problems for respective constituency groups.

## David Hogg

My program is in what might best be characterized as transition. Late in the summer, following a formal application and interview process, I was asked by Dean Aberle to accept the position of Executive Associate Dean in CALS. After much agonizing and soul searching, I accepted the offer, and started in my new role on September 16, 2002. I must say that in my experience of almost 23 years as a faculty member in Entomology, and the past 4 years as chair, being an associate dean is a very different job. I am enjoying the challenge but am still on a steep learning curve - I knew that CALS was a large and diverse college, but I am now beginning to see the extent of that first hand.

Although I have moved my office to Ag Hall, I will maintain a research program and my fourth floor lab, at least for the foreseeable future. Departmental colleagues, and especially Dan Mahr, have graciously assumed my teaching responsibilities, which I have had to give up entirely.

The main focus of my research is now on soybeans, and in particular the newly invasive soybean aphid. Bob Ellingson will soon be finishing his M.S. on soybean

aphid ecology and the impact of natural enemies, and he plans to pursue a Ph.D. in my lab; Bob has also been the lead person in a classical biological control program to release and establish the exotic soybean aphid parasitoid *Aphelinus albipodus* in Wisconsin. Robb Alleman, who worked jointly with Craig Grau in Plant Pathology and me, finished his M.S. last spring and is now employed by the USDA in West Virginia; Robb's thesis dealt with soybean aphid virus transmission competency and host plant range. Emily Mueller started an M.S. program last summer, succeeding Robb as joint between the Hogg and Grau labs; Emily will be working on aspects of virus transmission by soybean aphid. Scott Myers, who recently finished his Ph.D. with John Wedberg, is now a postdoc in my lab, working on economic thresholds and chemical control of soybean aphid. I also have two students conducting research projects on alfalfa. Reid Durtschi is using GIS and other spatial tools to examine patterns of potato leafhopper colonization and subsequent dynamics in alfalfa. Finally, Abdul Mohamed is in the final phases of his Ph.D. on behavior and ecology of the parasitoid *Microctonus aethiopoulos*, which attacks alfalfa weevil adults.

## Daniel Young

I still hold a 75 percent teaching--25 percent research appointment here in the Department of Entomology, with 5 percent of the research time going to serve as director of the UW Insect Research Collection.

### Teaching

Introduction to Entomology (ENT/ZOL 302) continues to occupy me extensively in both fall and spring semesters, with yearly enrollment of 75-100 students. I teach Taxonomy of Adult Insects (ENT 331) during the fall semester of odd-numbered years; this alternates with Taxonomy and Bionomics of Immature Insects (ENT 432), which is offered spring semester of odd-numbered years. During the "non-331/432 semesters, I continue to offer the Advanced Taxonomy series (ENT 701). Summers of even-numbered years I continue to offer the eight week summer session " Studies in Field Entomology" (ENT 468), the departmental "capstone

course. The two-week field segment to the Wyoming Rockies, and Black Hills region of South Dakota with wilderness camping and field work continue to highlight the course. Also during summers, I teach a one week course with Dr. Walt Goodman (ENT 875) designed for high school teachers who teach advanced or advanced placement (AP) biology.

I continue to direct undergraduate students involved in independent research study (ENT 299, ENT 699), and serve as undergraduate advisor for the majority of our undergraduate entomology majors, now regularly numbering in the mid- to upper twenties. I also serve as the faculty advisor for the Undergraduate

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Entomology Club (UEC), department liaison to the College of Agricultural and Life Sciences (CALs) for our undergraduate program, departmental "Study Abroad Advisor" for undergraduates, and am a member of the new CALs Career Service Committee. Many of our graduate students continue to receive their first real college teaching experience with me as part of the ENT 799, Practicum in College Teaching, typically assisting in the introductory entomology course. This semester, I have Lyric Bartholomay and Bob Ellingson helping in Ent 302.

### Research

My research interests, and those of his undergraduate and graduate students continue to be directed primarily toward the taxonomy, phylogeny and natural history of beetles.

Kerry Katovich completed his massive (750+ page) Ph.D. dissertation on the generic-level systematics of the daunting macrodactyline Scarabaeidae. He also quickly landed an Assistant Professorship down the road in the Biology Department at the UW Whitewater. Congrats to Kerry!

Nadine Kriska continues her Ph.D. on the systematics and taxonomy of two genera of Neotropical false blister beetles (Oedemeridae). In addition to serving as TA for my summer course, Nadine also successfully completed her prelims this summer and is now a dissertator. She and I will be heading off to London in January to conduct research at The Natural History Museum.

Alistair Ramsdale completed his M.S. conducting taxonomic revisionary work on several taxa of soldier beetles (Cantharidae); he is now working on a Ph.D. with Mike Ivie at the University of Montana.

Several "Young Lab" crew are getting toward the light at the end of the tunnel, and are beginning thesis writing--or will very soon.

- Craig Brabant, our lab "non-beetle outlier" is surveying the velvet ant fauna of Wisconsin--Mutillidae).
- Jeff Gruber is completing M.S. research on the hister beetle fauna of Wisconsin--Histeridae).
- Krista Lambrecht works full-time at the WI-DATCP

while conducting her M.S. survey of Wisconsin's lamiine long-horned beetle fauna--Cerambycidae (Lamiinae).

- Anneke Lisberg is starting to put her M.S. work on Wisconsin's tumbling flower beetles--Mordellidae into final order.
- Michele Price is also starting to write up her M.S. research on the sap and short-winged flower beetles of Wisconsin--Nitidulidae and Kateretidae.
- Eric Maurer is completing his second field season with M.S. research on prairie insect response to burning as a management tool.
- Sandi Statz's Ph.D. (systematics of *Staphylinidae*) is still on hold while she manages a full-time job in the biotech field and tends to her three kids with husband Eric.
- Andrew Williams (M.S. 1996) continues to play an instrumental role in prairie insect research in my lab as an honorary fellow. Andrew is completing another hectic season, primarily investigating in detail the life histories and trophic interactions of the entomofauna associated with milkweeds (*Asclepias* spp.) in Wisconsin.

My own research on taxonomy and systematics of the world's fire-colored beetle fauna (Pyrochroidae) has seen progress with several papers discussing nomenclatural problems, generic phylogeny, and describing new genera, new species, descriptions of larvae from Asia, and several additional manuscripts nearing completion. I have also been heavily involved as an editorial board member and contributing author for the newly published, two volume book, *American Beetles*. Kerry, Nadine, Michele, and Alistair have also contributed chapters to this update of the classic, *Beetles of North America*. I was presented with a "Special Achievement Award" by the Coleopterists Society at the annual meetings this past December, for the "greatest contribution by a single author."

### Administration

I continue to serve an administrative role as director of the UW-Madison Insect Research Collection (IRC). Mr. Steven Krauth, academic curator, and I also continue to serve as coordinators for regional inventory work on prairie insects. IRC growth continues to out-pace space and resources, due largely to the extensive field sampling efforts by "the Young lab" and partnerships with private and state agencies relating to biodiversity and insect inventory and monitoring research.

## *Phillip Pellitteri*

This is not Wisconsin anymore Toto. With the very mild winter of 2001-2002, I was preparing for an odd insect year. I told everyone who would listen we were really living in Missouri. Then we had a typical cold spring in May and many of the spring insects got stressed out.

But May did not make the whole year. The southern third of the state became invaded with the bean leaf beetles (*Chrysomlidea-Ceratoma trifurcata*). This insect rarely makes it's way into the state, but both soybeans and garden beans got hit very hard. The Chrysomlids in general did very well (most overwinter as adults) and we saw various species of flea beetles, cucumber beetles, and other leaf beetles enjoy have a banner year. Other "southern invaders" included a high number of cicada killers (*Sphecius speciosus*) and both adults and larvae of the imperial moth were reported numerous times. I heard an odd cicada one night that turned out to be *Tibicen pruinosa*. We do not have any specimens from Wisconsin in our collection but it is found in Iowa, Nebraska and Indiana.

We had one sample last year and another one this year of Duff millipedes submitted by a pest control company in Waukesha. These are small fuzzy millipedes that remind you of a carpet beetle larvae. They are a pest in the foothills of Colorado and are found in pine duff. I called Whitney Crenshaw at Fort Collins and he said it has never been seen outside the West. In both cases, the PCO found lots of bark mulch, and in the first case we suspected the mulch came from the west. In the new case this year the supplier claims it is all Wisconsin hardwood mulch. This is another case of the critters not reading the same books I do.

The spring weather slowed down the forest tent caterpillars, but the number of "friendly flies", the sarcophagid parasite of tent caterpillars, were high enough that people were complaining big time in the northern part of the state. And of course, we had the DNR conspiracy theory - they were releasing this native parasite from helicopters. Japanese beetles continue to spread and reek havoc in peoples' yards. We now have infestations in numerous communities south of a line from Green Bay and Eau Claire. We are finding as many as 50 grubs per square foot in turf. It is difficult to grow grapes, roses, or lindens in some communities. With

traps and milky spore disease not being effective, it is a hard lesson in insect biology for most homeowners. The onset of West Nile has a number of communities looking at mosquito control issues. The politics of organizing on a large enough scale to be effective will prevent any true abatement-type programs.

The most despised insect in the state is no longer the European earwig. It is the Asian Lady beetle (*Harmonia axyridis*). Aside from the major nuisance problem in the fall and winter, many people are developing allergies to the beetles. The insects can damage grape and raspberry crops(they make wine taste bad) and they will bite on occasion. Because of the introduction attempts by USDA there is a general feeling that somebody is to blame. There are numerous DNR conspiracy theories - releases for Gypsy moth control, soybean aphid control, ect. The Governor even gets complaints and I have talked to more than a few angry people who want to know who they can sue.

There continues to be a large increase in human bed bug cases. We have had a number of very severe cases in both hotels and apartment buildings. Some of the units have been treated four times and still have active infestations. Bed bugs were common until DDT came aboard and then almost disappeared. Now the combination of IPM - where we use baits rather than residual sprays, and I think pyrethroid resistance has made the problem common.

We continue to see exotic Cerambycids samples come into the lab. We had intercepts for India in pallet wood, Asia (pallet wood, artificial Christmas trees, and bamboo objects) and Italy. The APHIS do not like getting calls from me anymore. They do a great job of chasing down the problem, but many companies are reluctant to report anything odd out of fear of being closed down for a few days while the problem is addressed. We have been lucky that none of these have established as far as we know.

The biggest change in sample submission is the use of the digital camera. A large number of county Extension offices and individuals submit JPEG files via e-mail. Over 90 percent are of good enough quality to be able to give an identification without seeing the specimens.

## Walter Goodman

The Goodman lab is once again undergoing transition. Josh Young, an M.S. student finished his degree in June and is now at Abbott Labs in North Chicago, IL. He has left Entomology for that more lucrative field - pharmacology. While here, Josh discovered the first significant and stable mutations in the hemolymph juvenile hormone binding protein (hJHBP) gene. A recent microbiology student from Cornell, Nick Pacelli, will be picking up where Josh left off. Sharon Doll, an associate scientist working in the lab, is hard at work digging out promoters and enhancers for hJHBP. Her husband, Marco DeCamillis, who some of you may know from the French-Constant lab, is teaching at Beloit College. Tony Orth, a recent Ph.D. student from the lab, is now a senior scientist at the Genomics Institute of the Novartis Research Foundation in San Diego. Elisabeth Gardner, a recent Ph. D. from the Strand lab just took a new job at a biotech startup company in San Diego. The Hilldale Undergraduate Scholars have now left the lab. Ruthann Warnke is now

working for WARF doing stem cell research. Sabrina Simpson entered med school this summer at the Medical College of Wisconsin and Hannah Burack is now an entomology grad student at UC-Davis.

The teaching duties this year have changed. I am now a faculty fellow for the Bradley Learning Community and am a co-instructor in a freshman course developed by Dean Barrows. It's a great opportunity to troll for prospective graduate students. With the departure of Mike Strand, a gap occurred in our teaching so I agreed to teach Entomology 201 in the fall semester. Dr. Lan has graciously taken over teaching Entomology 321, insect physiology, until we can get the situation under control. Entomology 201 exploded in size this semester with 140 students enrolling. This is nearly double our class size from last year. Given Dr. Paskewitz's excellent teaching, this class will see nearly 300 students per year.

## Que Lan

I have settled down in Madison and love this great city. I also started to teach Insect Physiology this Fall. There have been some changes in Lan's lab. Miss Kristina L. Brzoza and Mr Kendall C. Krebs graduated from the UW and left the lab. Both are working in other research laboratories as technicians. Good luck Kristina and Kendall on your new jobs.

We welcome two new students to the lab. Miss Amanda Pitterle is from Verona High School. She works in the lab as part of her biotechnology training, required by the regional work-based training program. She is working on cloning of some of the genes from mosquitoes.

Miss Eleanor J. Blitzer is a junior undergraduate student at the UW. She conducts her independent research projects in the lab. She will be working on cloning and studying some larval/pupal specific genes from mosquitoes.

Miss Irina Vyazunova is going to continue her doctoral training here. The research will focus on a larval cuticle

and the sterol carrier protein genes of *Aedes aegypti*. She will be studying how these genes are regulated during larval and pupal stages.

Dr. Dave Bowen continues his research in the bacterial toxins. He has been using the insect cell culture systems to study the mechanisms of those bacterial toxins. He also started to make protein crystals of the toxins so that we can solve the 3-dimensional structures of the toxins.

### Recent publications:

Kendall C. Krebs, Kristina L. Brzoza and Que Lan. 2002. Use of Subtracted libraries and Macroarray to Isolate Developmentally Specific Genes from the Mosquito, *Aedes aegypti*. *Insect Biochemistry and Molecular Biology*. *In press*.

Kendall C. Krebs and Que Lan. 2002. Isolation and Expression of a Sterol Carrier Protein-2 Gene from the Yellow Fever Mosquito, *Aedes aegypti*. *Insect Molecular Biology*. *In press*.

## *Ken Raffa*

Since the last newsletter, Jaimie Powell has completed her Ph.D. program. Congratulations Jaimie! My current students include postdoctoral associates Italo Delalibera and Brian Kopper; doctoral students Brian Aukema, Celia Boone, Nichole Broderick, and Shahla Werner; Master's student Renee Pinski; and an undergraduate, Eva Lewandowski, who is doing an independent study. We had a fun summer, with a great crew of four undergrads being exposed to our science, field excursions, and idiosyncrasies. Our great lab manager, Greg Richards, has moved on to grad school with a WARF Fellowship right here in UW's Microbiology Program. Best of luck Greg and thanks for everything! Since Greg's departure, we've all come to realize that we don't really know much about running a lab.

We're participating in a number of collaborative projects with Barb Illman, Skeeter Werner and Ed Holsten in Alaska; Don Dahlsten and Nadir Erbilgin in California; Diana Six in Montana; Kier Klepzig in Louisiana; Rick Harrison in New York; and Jo Handelsman and Bob Goodman at UW.

We have a few new toys in the lab: especially the molecular equipment Italo uses, a new freezer, a new

IBM clone as more and more of our people move to the Dark Side, and a new oven thanks to an overnight accident which the custodial crew admirably notified us of. Research in our laboratory concentrates on aspects of plant-insect, predator-prey, and insect-microbial interactions affecting forest insect population dynamics. Some ongoing studies include tritrophic interactions in the epidemiology and chemical ecology of bark beetle-root beetle-fungal complexes, bacterial symbionts of leaf feeding caterpillars and subcortical beetles, and invasive species affecting forest health.

Outreach program interfaces various state and federal agencies on insect pests and invasive species. My teaching program includes Insects and Disease in Forest Resource Management, Plant-Insect Interactions, and Methods of Scientific Presentation. This semester I helped teach Insect Pest Management, so I had to quickly refresh myself on population modeling. Those who know me realize I have periodically committed modeling, so this could lead to a relapse.

## EGSA

The current EGSA officers encourage all students to become involved and attend meetings. We have a good group of folks this year and we are enthusiastic about exercising our right to full representation on all department committees, a privilege that not many departments allow their students. We're also here as a resource for the new students. If you have any questions, come ask the folks that have been here for a while.

Your officers for this year are:

President: Andy Bouwma (Jeanne Lab)

Vice-President: Craig Brabant (Young Lab)

Treasurer/Secretary: Jenny Jandt (Jeanne Lab)

Fundraising Committee: Steve Hong (Williamson Lab)

Finance Committee Chair: Anneke Lisberg (Young Lab)

Finance Committee Member-at-large: Emily Mueller (Hogg Lab)

Colloquium Student Representative: Chris Perry (Mahr / Wyman Labs) and Nadine Kriska (Young Lab)

Academic Affairs Student Representative: Nadine Kriska

Extension Committee Student Representative: Reid Durtschi (Hogg Lab)

Computer Committee Student Representative: Craig Brabant

We welcome the new addition to our department, Dewayne Shoemaker, and the exciting research program he brings with him, and look forward to his bringing in new students to the department. We also look forward to Claudio Gratton's arrival in January and the contributions he will make to our department's strong research tradition.

We held our annual Fall Picnic in October and had a great turnout despite the gray chilly weather. Thanks to all of the folks who came out despite the weather and enjoyed brats, burgers, and talk of theses not yet finished. Special thanks to Craig Brabant for organizing the event and for his willingness to jump into the role of head of security when called upon.

Before you know it, it will be time for our famous Thanksgiving Turkey Lunch.

According to Carol, last year's Turkey Day lunch was the best attended ever, and we hope to match that success this year! Keep an eye out for signup sheets for dishes to bring and we hope to see you all in November.

## *Insect Ambassadors*

The Insect Ambassadors are a group of undergraduate and graduate students, mostly from the Entomology department. We volunteer our time to travel to local schools and other community organizations to introduce kids to the amazing world of insects. The goal of the presentations is make kids aware of the importance of insects in the world ecosystem, their relevance in our everyday lives, and merit for study. Over the three years that the Insect Ambassadors have been active, we have reached out to more than 3,000 students. The Madison area has responded very positively to our outreach efforts as is evidenced by the volume of requests we receive every semester. The participation of students in outreach activities is something that benefits both the presenters and the department. When students who are working on research degrees take a little time to get involved in the community they are

participating in the "Wisconsin Idea", and the image of the department gets a substantial boost. Participation is beneficial for the presenters for it allows them to hone their public speaking skills, practice explaining their research to the layperson, and to get valuable teaching experience. Dr. Charles and Patricia Koval (UW Entomology, Emeritus) generously donated \$25,000 to the Insect Ambassadors in order to support these efforts. This money will be put towards developing an Insect Ambassadors project assistantship and to cover our travel expenses, which the department has generously covered in the past but may not be able to in the future because of budget cuts. If you would like more information about the Insect Ambassadors or would like to make a donation, contact us at [insectambassadors@entomology.wisc.edu](mailto:insectambassadors@entomology.wisc.edu) or check out the link to our web page from the department page.



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