



IOWA STATE UNIVERSITY

Department of Entomology

January 2007 Newsletter For Alumni and Friends

Symposium Held in Honor of Coats

Dr. Joel Coats was the recipient of a major American Chemical Society (ACS) award: the International Award for Research in Agrochemicals.

A symposium on natural products and environmental toxicology was held in his honor at the ACS national meeting in Atlanta in March.

Several of his former students presented at the symposium. Coats has studied insect and environmental toxicology for 30 years and spearheaded the formation of the interdepartmental toxicology program at Iowa State University.



Left to right: James Seiber (USDA-ARS, Albany, CA), Donald Wauchope (USDA-ARS, Tifton, GA), Joel Coats, Aldos Barefoot (DuPont Ag, Wilmington, DE).

Like Politics, All Tsetse Flies are Local

This article describes research conducted by Dr. Elliot Krafur and colleagues. This research was funded by an NIH grant, which terminates in 2007, at which time Elliot will officially retire.



Resting tsetse fly. (Photo courtesy of the DFID Animal Health Program.)

About 14 years ago, while speaking about screwworm population dynamics at a symposium on modeling animal diseases in Nairobi, I was asked by a senior British civil servant, Reg Allsopp, if the tools of population genetics might be useful in the context of areawide tsetse fly control programs. The short answer was "yes," because one could make indirect estimates of gene flow in terms of theoretical numbers of reproducing animals exchanged among demes of a much larger metapopulation. And, in theory, we can identify immigrants in a treated area (albeit with wide standard er-

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Bee Careful

Entomologist Steve Hanlin (left) and research technician John Van Roekel, both of the USDA–Agricultural Research Service, work on buckfast honey bee nucleus hives. The bees are used for pollination at the Plant Introduction Station, a joint venture of the USDA–ARS and Iowa State, located at Mortenson Road and State Avenue.



Fall preparations include checking the hives to make sure they are active, marking the queen bees, treating the hives for varroa mites, and

reducing the size of hive entrances to keep the bees from stealing honey from each other. The hives move indoors to “overwinter” from late November to late February. Photo by Bob Elbert.

Ticks Galore!

The Medical Entomology Laboratory, under the supervision of Dr. Lyric Bartholomay, continues to monitor ticks and tick-borne disease in the state of Iowa, in the context of research, education, and outreach. Jon Oliver, a master’s candidate in the lab, spent the summer dragging for black-legged ticks in forested parks in central and eastern Iowa. Those ticks will be



Life stages of Ixodes scapularis.

used in a larger Lyme disease risk assessment study coordinated by Dr. Durland Fish’s lab at Yale University. In

terms of education, the lab jointly hosted a Tick Identification Workshop on July 13. Workshop instructors included Drs. Joel Hutcheson and Jim Mertins, and Jeffery Alfred (also a student in the medical entomology laboratory) from the USDA National Veterinary Services Laboratories (NVSL) in Ames. Seventeen attendees included faculty, staff, and students from ISU and University of Iowa, and students and staff from county and state public health agencies. Finally, the lab continues a surveillance project, through which Iowans are encouraged to submit tick specimens that are identified to species, and, if confirmed to be blacklegged ticks, are tested for the presence of the Lyme bacterium. These data are used to report the distribution of ticks, and an indication of infection status in blacklegged tick populations, on the laboratory website at <http://www.ent.iastate.edu/medent/>.



From the Chair's Perspective

Receiving my greeting in the ISU Entomology Newsletter means that another year has passed and that it is time to update you on the exciting happenings in the department. And before I forget, I remind you that ISU will soon be 150 years old (1858–2008). To commemorate this event ISU is planning a year-long celebration, inaugurated at the VEISHEA weekend of this year, 2007. The celebration will highlight significant accomplishments of ISU and its staff with daily postings of these accomplishments and special activities to commemorate them. Entomology will dedicate seminars to the celebration of this event.

In spring of this past year, ISU went through a National Research Council (NRC) accreditation review. We passed with “flying colors”! The review was centered around “student learning outcomes,” which have been posted on the websites of all the colleges and departments. We will continue to revise our learner outcome assessments and to tie the assessments back to improvements in our curriculum. I would be happy to have you e-mail me, tolly@iastate.edu, to tell me about your learning experience at ISU. We will probably reach out to you with a more formal questionnaire to assess your learning outcomes and to determine how well we prepared you for your careers.

Speaking of assessment, in January the *Chronicle of Higher Education* published the Top Research Universities in the 2005 Faculty Scholarly Productivity Index. The 2005 index compiled overall institutional rankings of 166 large research universities, which include 15 or more Ph.D. programs as well as 61 smaller research universities, which contain between one and 14 Ph.D. programs. The index was compiled by Academic Analytics, a company owned partially by the State University of New York at Stony Brook; it ranks 7,294 individual

doctoral programs in 104 disciplines at 354 institutions. For a program to be included in the 2005 index, it must have 10 or more faculty members, or, if it has fewer, it must have one-half the median number of faculty members for a program in that discipline. Of the entomology departments assessed, the Entomology Department at Iowa State University ranked 9th.

The index examined faculty members listed on Ph.D. programs’ websites, a total of 255,475 names. The number of actual faculty members rated by the index was 177,816. The productivity of each named faculty member was measured on as many as three factors, depending on the most important variables in the given discipline: publications, federal-grant dollars awarded, and honors and awards.

Now for an update on the “state of the department”: Last year the Legislature awarded “one-time funding” for some University functions. We are waiting to see whether they will include them in this year’s budget allocation as “ongoing” appropriations. If they do not, we will have to make a permanent cut in our FY08 budget of approximately 2% to cover the shortfall. The College of Agriculture is planning to meet these cuts, if they must be made, by freezing five of 11 open positions and reducing all departments’ budgets by 1.75%. Entomology has one of the six positions that have not been put on hold, yet. This is a research and teaching position in corn pest management; a backfill for my position.

The importance of a full-time corn



Jon Tollefson

The Entomology Department at Iowa State University ranked 9th.

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Kyung Seok Kim's Research Published in *Science*

The western corn rootworm is the most destructive pest of corn in the United States, and it is now spreading in Europe after first being detected near Belgrade in 1992. Microsatellite DNA markers were developed for western corn rootworm by Dr. Kyung Seok Kim of USDA-ARS Corn Insects & Crop Genetics Unit and Iowa State University, working in Tom Sappington's project. A team of French scientists used his microsatellite markers and genotypes of western corn rootworm from three U.S. populations to demonstrate, to everyone's surprise, that introductions of the rootworm to Europe from North America are apparently ongoing and frequent. Dr. Kim's collaboration and ground-breaking research accelerated this project by at least a year, and the findings were published in *Science* (Miller et al. 2005, 310:992). Because outbreak populations may be coming from different locations in the United States, they could differ substantially in their response to pest management strategies such as insecticide treatments and crop rotation. These results highlight the role of transoceanic transport of harmful pest species and suggest that more attention should be paid to



Kyung Seok Kim

controlling insects on intercontinental flights. Meanwhile, ongoing research is focused on using Dr. Kim's and new genetic markers to narrow down the geographic source of the western corn rootworm émigrés to Europe.

Chair's Perspective, continued from page 3

entomologist has been emphasized by the dramatic increase in biofuel production. When all the ethanol plants in production, under construction, or planned in Iowa are in operation, there will be a shortage in corn grain. This shortage has driven corn prices up—a good thing if you are a corn-grain producer, but a bad thing if you must buy corn to feed livestock. To meet the demand, more cropland will be planted to corn, meaning more problems from corn rootworms, the most important corn pest. At the same time, the rotation-resistant trait is being found in the Iowa western corn rootworm population, which puts the rotated corn acres at risk as well as the increased acres of corn-on-corn. These changes have dramatically emphasized the need for a full-time, younger (did

I say that?) corn entomologist.

I close with a request that relates back to my opening paragraph. Our next Alumni Newsletter will be published during the 150th celebration. In preparation for the edition, I would like to hear from you. What are the significant happenings in your life? Let me know so that we can share them with our alums and friends in our Newsletter that celebrates the 150th. Stop by to visit us during the year. There will be displays and events throughout the year. I wish you all a very successful Cardinal & Gold New Year.

Go Cyclones!
Jon Tollefson, Chair

Tsetse, continued from front page

rors). Reg wanted to know what would be required to carry out such studies on gene flow in tsetse. My answer was adequate sampling and shipping the flies to Iowa. I planned to use preliminary data to obtain support in the NIH sweepstakes competition to carry out the genetics work.

About a year later, I received a letter from Dr. Nigel Griffiths at Imperial College, University of London, reminding me of the *Anopheles gambiae* species complex (most are efficient mosquito vectors of the parasites that cause malaria) and asking whether I might examine several tsetse species on which he was carrying out behavioral studies in numerous African locations. Nigel was puzzled by pronounced geographical differences within species and was thinking of species complexes. It seems that Reg had insisted, as Her Majesty's granting officer, that Nigel include a genetic component to the research, because tsetse behavioral responses varied from place to place.

That's how it began. Nigel began carrying around liquid nitrogen during his African field trips and sent the frozen flies to me at ISU. With much help from my undergraduate hourly lab assistants David Wohlford, Mark Madson, and Mark Endsley (all coauthors on publications), we found a surprisingly substantial amount of genetic diversity in each of the five species of tsetse that Nigel sent us. Genetic diversity is related to historical population sizes. Larger effective (reproductive) populations tend to have greater genetic diversities. This diversity, therefore, suggested that tsetse populations were not quite so small as had been thought. Much more surprising, however, was the high degree of reproductive isolation among conspecific demes. The genetic data pointed to fairly localized tse-

tse fly demes—even those separated by tens of kilometers.

Now, tsetse ecology has been seriously and expertly studied for a hundred years because these flies are the only vectors of the trypanosomes that cause a lethal wasting disease: sleeping sickness in humans, and nagana in domestic animals. Animal agriculture is usually unsuccessful wherever tsetse flies are abundant, which is the greater part of sub-Saharan Africa. Received opinion

We found a surprisingly substantial amount of genetic diversity in each of the five species of tsetse that Nigel sent us.

about tsetse flies is that they are highly mobile ("vagile") and subject to rapid dispersion, quickly filling any vacuum created by seemingly effective control procedures. I say "seemingly" but am getting ahead of things and will defer explanation until later.

First, a little background on tsetse fly biology. Tsetse flies are exclusively blood feeders: they don't even imbibe sugar water. Earliest reproduction is at day 15 of adult life, with subsequent larvipositions at 9- or 10-day intervals thereafter. Only a single larva develops in each reproductive cycle. Thus, an average female must live at least 35 days to replace herself and her mate.

It would seem that an effective tsetse control method should rapidly wipe out a population.

Demographic studies indicate daily mortality rates among adults of only 1 to 2.5% (for contrast, a 16% daily mortality rate is

about average for the most serious malaria vector mosquitoes). Tsetse populations usually decline when daily mortalities exceed 3%. The minimum generation time is about 45 days and population doubling time is about 45 days when daily mortality rates are 1.5%. Mark, release, and recapture experiments indicate high dispersal rates. So, tsetse flies demonstrate low reproduction rates but are long lived in compensation. We might say they are k-selected species, to invoke an old paradigm.

Tsetse, continued from page 5

It would seem, given their low reproductive rates, that an effective tsetse control method should rapidly wipe out a population. Effective control methods include baited traps, insecticide-laced targets, and aerial sprays applied over large areas. Nevertheless, tsetse flies seem always to recover. And immigration is the usual suspect.

If population recoveries were a result of immigration, however, we should detect a much greater degree of genetic homogeneity among the populations than we have observed. Instead, our genetic data, assembled by Johnson Ouma and Gerardo Marquez, show clearly that in two historically well studied test regions in Kenya that resident tsetse were not wiped out and replaced by immigrants as claimed, but repopulated by indigenous survivors. It would seem, therefore, that tsetse sampling protocols require much improvement. Negative sampling returns do not predict absence of the targeted insect.

So, how can we explain the contradiction between vagility and genetic differentiation?

For a start, we can look to natural selection and ask whether tsetse populations are locally adapted; is the reproductive success of migrants small because they are at a reproductive disadvantage with respect to resident flies? This hypothesis has several components, some of which are:

- Sex pheromone varies among populations
- Temperature and moisture regimes jointly act as selective agents

Project collaborators Dr. Russ Jurenka at ISU and Dr. Steve Chown at the University of Stellenbosch, South Africa, tested the foregoing hypotheses in diverse populations. Russ found that the cuticular hydrocarbons known to serve as sex pheromones were homogeneous, there-

by falsifying sexual selection as a hypothesis. Steve and his pupil John Terblanche showed that responses to temperature and water stress in tsetse flies were homogeneous in the same populations. Rates of desiccation, however, varied. Moreover, Russ demonstrated that waterproofing cuticular lipid amounts varied, but

did not correlate with rates of water loss. We also have shown no obvious relationship between environmental variables

as determined by satellite imagery (e.g., the normalized density vegetation index, provided by Oxford collaborator David Rogers), genetic distances, and desiccation rates. But these are early returns; the quest continues.

So, where do we stand? It remains to be determined whether other environmental surrogates (measured by remote sensing) separately or together might correlate with the extraordinary degree of genetic differentiation among tsetse populations. It seems now, however, that any such correlation would not have much explanatory power, given the homogeneous responses of tsetse populations to stress.

For now, all we can say for sure is that the force of genetic drift is much stronger than the homogenizing force of dispersion. Learning exactly why this is so may require intensive sampling studies, sophisticated environmental measures, and advanced statistical procedures.



Elliot S. Krafur

BugGuide.net comes to Iowa State

Troy Bartlett, an amateur entomologist and insect photography enthusiast from Roswell, Georgia, had an idea for an online community where fellow photographers could submit insect and spider photos and learn more about entomology. In 2003, Troy developed this idea through a website he named BugGuide.net. The website can be viewed at <http://bugguide.net>.

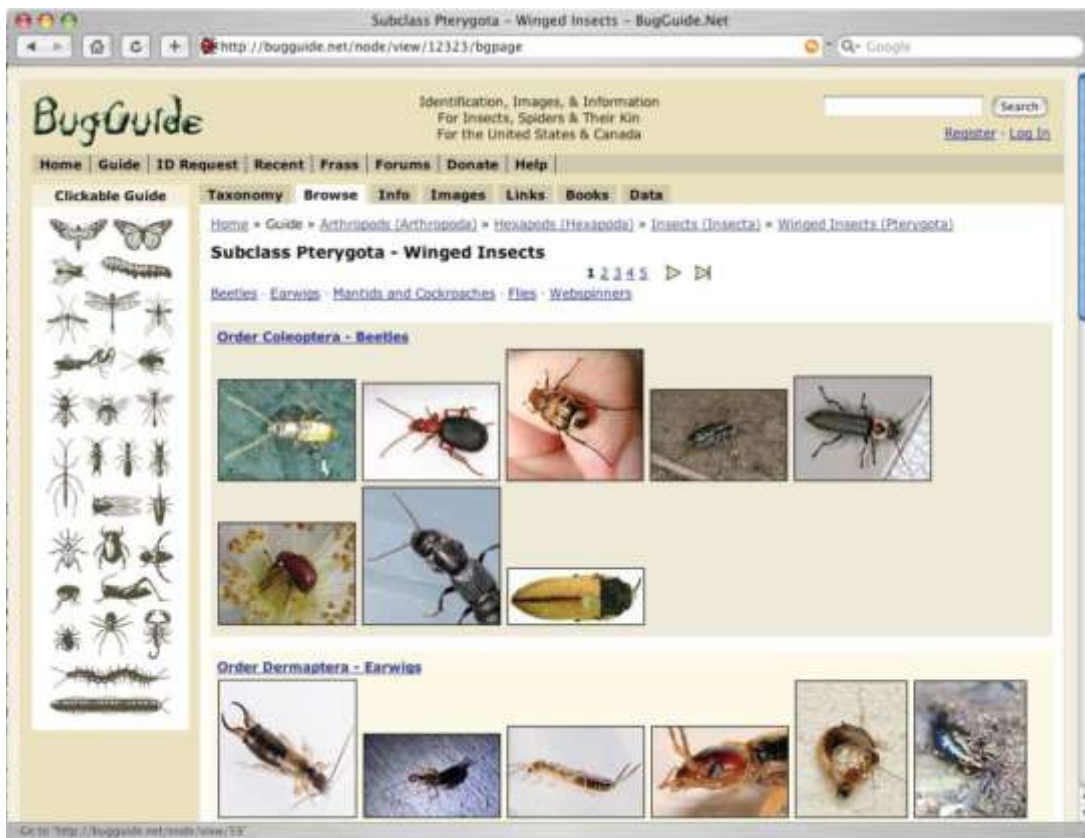
By August 2005, BugGuide had become so popular that it was overwhelming both the server it was on and Troy's free time. He began seeking a new home for the website. John Van Dyk contacted Troy and together they moved

the site to its new home in the Department of Entomology's data center where it currently receives more than a million hits per day and is one of the top users of bandwidth on Iowa State University's campus.

BugGuide has an active user community that helps to identify submitted insect photographs. Once an insect is identified, the photo is placed into the guide in its correct taxonomic location. The guide contains more than 12,000 pages, including pages dedicated to insect orders, families, genera, and species. More than 75,000 images have been submitted by more than 10,000 contributors.

Forums provide a common area to discuss taxonomy changes, technical problems, and photography tips.

Long-time users on the website can advance to editor status, which gives them more access rights to help maintain the site. Often an editor focuses on one or more areas of expertise inside the guide.



Left: a page of thumbnail images from the BugGuide website.

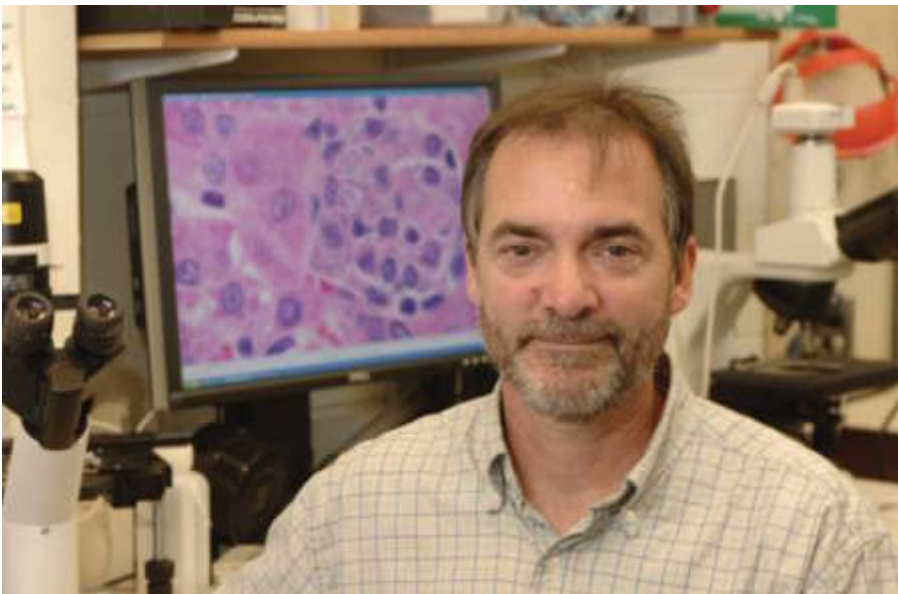
Did you know?

Nine laboratories on campus in the departments of Entomology, Plant Pathology, Agronomy, and Biochemistry, Biophysics, and Molecular Biology are currently working on aphid-related research.

Jeffrey Beetham, Associate Professor

Leishmania spp. are insect-vectored parasites that cause serious disease in humans (with more than 2 million cases per year) and animals throughout more than 80 countries. In

tween the time of the blood-feeding transmission and that of being taken up by immune cells, parasites are exposed to human blood proteins that typically attack foreign microbes and cause them to burst. We are pursuing several strategies to investigate how infectious *Leishmania* parasites survive these few minutes of exposure. Dr. Amanda Ramer is using flow cytometry to identify and characterize human antimicrobial blood proteins that bind to the parasite. Graduate students Rebecca Laborde, Samantha Lei, Eric Scolaro, and Nathan Romine are working to identify *Leishmania* genes that enable the parasite to survive, by expressing these genes to rescue noninfectious parasites that do not survive blood exposure. Research in both



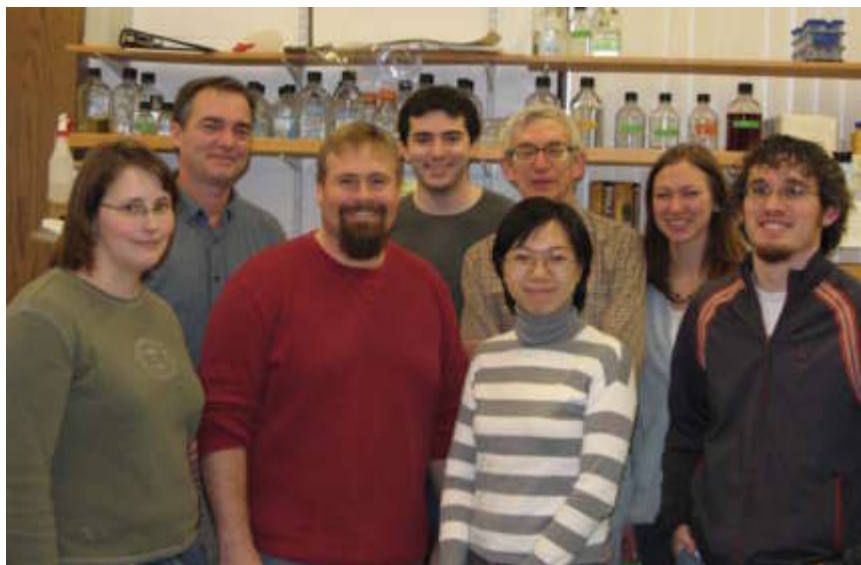
Jeff Beetham

the current confrontation in Iraq and Afghanistan, there have been more than 2,000 cases of leishmaniasis causing debilitating skin lesions within the U.S. military. Our lab focus is on *Leishmania chagasi*, one of several species responsible for a particularly severe form of leishmaniasis, called visceral leishmaniasis, for which the annual infection rate is about half a million people. Absent proper drug therapy, the fatality rate for visceral leishmaniasis can exceed 90%. Present drug therapies are problematic, and as for almost all other protozoal disease agents, there is no effective vaccine against leishmaniasis.

We are interested in determining how the parasite survives during the first few minutes after transmission to the human host by blood-feeding of an infected sandfly. After a short period, newly transmitted parasites are taken up by immune cells in which parasites multiply. Be-

between these areas is further supported by Christian Bartholomay and Dr. Dennis Byrne.

One expected outcome of these studies is
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Beetham research group. Left to right: Rebecca Dahlin-Laborde, Jeffrey Beetham, Christian Bartholomay, Nathan Romine, Dennis Byrne, Samantha Lei, Ashley Grimes, Eric Scolaro. (Amanda Ramer, not shown).



Gregory Courtney, Professor

Dr. Courtney's research focuses on insect taxonomy and aquatic entomology, with emphasis on revisionary systematics, phylogenetics of true flies (Diptera), and biodiversity of aquatic insects. Much of his research aims to describe insect taxa and elucidate their phylogenetic relationships. Projects have focused on lower (nematocerous) Diptera, including Blephariceridae, Psychodidae, and Tipuloidea. Greg has been especially active in revisionary and phylogenetic studies of aquatic Diptera. Aquatic flies are unique in that most species cross the interface, and thus they affect energy exchange between freshwater and terrestrial ecosystems. Unfortunately, our understanding of these processes, and of freshwater ecosystems in general, is stymied by the lack of information on biodiversity and on phylogenetic hypotheses through which these processes can be placed in a historical context. Greg has been addressing these issues through studies of aquatic insect communities in North America, Europe, Australasia, and Southeast Asia. Results are providing insight on regional biodiversity and the biogeographic relationships between faunas. Data also have important implications for the use of aquatic insects as bio-indicators of water quality.

Greg teaches field- and lab-based courses in Systematic Entomology, Aquatic Insects, Advanced Systematics, and special topics (e.g., Immature Insects), and he has led three international taxonomic workshops. He also has been an active participant in the Ecology and Evolutionary Biology (EEB) interdepartmental graduate program, serving as the current chair and having led three EEB field trip courses. Greg has approximately 50 scientific publica-

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a better understanding of the parasite surface late during infection of a sandfly and early during infection of the vertebrate. We plan to investigate whether parasite surface molecules found to confer survival in blood also have bio-



Greg Courtney collecting aquatic insects.

tions, most of which are either systematic revisions or regional studies of faunal biodiversity. He currently has a dynamic group of graduate students, including three pursuing a Ph.D. degree and two an M.S. degree. Since joining the ISU faculty in 1997, Greg has served as major advisor or co-advisor to 14 graduate students, nine of which have graduated.

logical function within the insect vector. Our current molecular and biochemical studies have the potential to lead to studies of parasite ecology as it relates to vector-parasite-host interactions.

Jeff Beetham

Russell Jurenka, Professor



Russ Jurenka

Russell Jurenka is busy studying pheromone biosynthesis in female moths. His lab has recently identified the receptor that is involved in regulating pheromone biosynthesis in the pheromone gland. This receptor belongs to a large family of proteins called G protein-coupled receptors. The receptor was identified based on sequence homology with receptors from humans and *Drosophila*. Recent genome-

sequencing projects involving mosquitoes, the flour beetle, the honey bee, and silkworm have identified additional receptors. These findings indicate that the receptor and ligand are conserved in all insects. However, functions for the peptides and receptors are mostly unknown in most insects. They are involved in regulating pheromone biosynthesis in moths, but they also have other as yet undefined regulatory functions in other insects. This is a highly conserved group of receptors and peptides because they are also found in humans and other vertebrates where they regulate a variety of physiological functions, including feeding behavior. Current and future research will identify agonists and antagonists that act on this receptor, providing potential compounds that can be evaluated as drugs in humans or used in insect pest management.

Fundamental aspects of moth pheromone biosynthesis also are being explored. We are trying to clone two genes that produce the aldehyde pheromone in the corn earworm. These enzymes could be used in a mating disruption control strategy where aldehyde pheromone is produced to mimic a female moth. This technology could be used in an attract-and-kill strategy for pest control.

Jurenka started teaching Insect Biology (Ent 370) when Dr. Elwood “Woody” Hart retired in 2002. He also took over as academic advisor for the undergraduate students at the same time. He has continued to teach Insect Physiology (Entomology 555).

Nathan Brockman, Staff

Nathan Brockman was listed as one of the 10 most intriguing people on campus by the Iowa State University Spring 2006 *Visions* magazine. The following article, written by Carole Gieseke, first appeared in that issue.

Nathan doesn’t understand why people are so afraid of spiders and insects and other creepy-crawlies. Heck, he collects them, keeps

them as pets, works with them every day, and even, on occasion, eats them.

But he has a theory.
“There is misunderstanding and fear of the unknown. People are taught to be afraid,” he says. “Kids learn to be scared from their parents. There are myths about insects that aren’t

Continued on next page

Featured 2006 Graduate: Brendon Reardon

Brendon Reardon is an alumnus of the Department of Entomology at Iowa State University. He is currently a postdoctoral scholar at the University of California-Riverside. Brendon works in the laboratory of Dr. Elaine Backus at



Brendon Reardon

Brockman, continued from page 10

true. And the media doesn't help much, with movies, stories, even nursery rhymes."

Brockman never bought into all that. As a kid growing up on the outskirts of Fort Madison, Iowa, he spent hours in the woods, collecting as many insects as he could find. He created elaborate houses for them. He had a massive ant colony made out of sand, surgical tubing, and milk jugs.

So it's no surprise that Brockman has made a career out of working with bugs.

"One day when I was sitting at the kitchen table doing homework, my mom laid the encyclopedia in front of me to the entomology page and said, 'Look, you can go to school and play with insects all day!' And from then on, that's what I knew I wanted to do."

As a student, Brockman worked in Iowa State's Insect Zoo, was involved in the Entomology Club, and was featured on "Ripley's Believe It or Not" snacking on live grubs and mealworm caramel apples. When he graduated in 2000, the Entomology Department created a

the USDA-ARS San Joaquin Valley Agricultural Sciences Center at Parlier. Brendon is examining the feeding behavior of the glassy-winged sharpshooter, *Homalodisca coagulata* (Say) (Hemiptera: Cicadellidae), by using videography, electromyography, and electrical penetration graph monitoring. He earned a B.A. (Biology major, Chemistry minor) from the University of Vermont in 1998 and an M.S. (Entomology major) from Texas A&M University in 2001 under the tutelage of Drs. Dale Spurgeon and L. Ted Wilson. In 2006, he earned a Ph.D. (Entomology major, Statistics minor) from Iowa State University under the guiding lights of Drs. Tom Sappington and Les Lewis. Brendon's graduate research was on insect ecology, insect resistance management, and integrated pest management. He met his lovely wife, Kate (Kronback) Reardon—also a graduate of Iowa State University, while working in Ames.

position for him at the zoo. Then, Reiman Gardens added its butterfly wing, and Brockman was hired as its butterfly curator.

"It's a dream job," says Brockman. "I tell people I play with butterflies for a living."



Nathan Brockman

Featured Undergraduate: Brendan Dunphy

To Brendan Dunphy, college is not a vehicle for employment but rather a vehicle for exploration of the world and himself, so he has attempted to exploit ISU for as many opportunities as possible.

Since his arrival at ISU in fall 2003, Brendan has attended Humboldt State University



Brendan Dunphy collecting turtles.

and the University of Massachusetts, Amherst on exchange, and in summer 2005, he accompanied Dr. Marlin Rice on his biological field trip to Tanzania. In 2007, Brendan will return with him as his assistant.

Brendan has worked in the laboratories of Drs. Charlie Drewes, Jeff Beetham, and Lyric



Brendan Dunphy in James and the Giant Peach.

Bartholomay, and at his graduation in May 2007, he will be awarded three baccalaureates in entomology, zoology, and animal ecology.

His biological studies, though, account for only one realm of Brendan's life as recent time has witnessed a progressive manifestation of the more humanistic and artistic aspects of his personality, evidenced by his newfound infatuation with theater. Since the fall 2005 semester, Brendan has acted in such productions as *James and the Giant Peach*, *A Christmas Carol*, *Macbeth*, and *A Midsummer Night's Dream*. Brendan is the first recipient of the Wayne A. Rowley Scholarship.

Osborn Research Club Provides Forum for Ideas

The Iowa State University Osborn Research Club was founded in 1921. Members of the club are active researchers within the natural or physical sciences, and the club provides a forum for exchange of ideas across scientific disciplines. Further information can be found at:

<http://www.ent.iastate.edu/osbornclub/>

The club was named in honor of Dr. Herbert Osborn. Osborn was a member of the

Department of Zoology and Entomology of Iowa State College from 1879 to 1898 and served as head of the department from 1882 to 1897.

He was the first state entomologist of Iowa. His research interests were largely concerned with the taxonomy and biology of the Hemiptera, Anoplura, and Thysanoptera.

Many insect species bear his name, and he was author or coauthor of more than 500 publications.



Insect Zoo: Strength in Collaboration

The collaborative efforts going on behind the scenes at the Insect Zoo during this past year have been exciting to say the least.

Last fall the Insect Zoo was adopted as a class project by three undergraduate students from the College of Art and Design. They were assigned the task of developing marks for the Insect Zoo to use in a variety of materials. The students did a remarkable job developing their concepts by using the natural colors of the insects as inspiration for the hand and computer generated works. Their creations have appeared on informational resources, murals, bug-mats for outreach programming, temporary tattoos, and t-shirts.

The Insect Zoo began collaborating with the College of Agriculture’s experiential learning and work program, Science with Practice, in fall 2005. To date, the Insect Zoo has had several students participate in the program with most completing multiple semesters. Student projects have focused on a variety of rearing practices for the Insect Zoo’s live collection.

During summer 2006, Dr. Greg Courtney and staff member Angela Tague hosted Nikeya American Horse and Jordan Shell Track, two high school students participating in the George Washington Carver Internship program. Nikeya and Jordan traveled to ISU from Standing Rock Indian Reservation, North Dakota. While interning, they were involved in all aspects of the Insect Zoo, including rearing room specialist Matt Wihlm

Nikeya American Horse assists day camp participants in learning the finer points of handling hissing cockroaches.

training them to care for and rear a variety of arthropods. The pair also traveled with Insect Zoo presenters to a variety of venues assisting with outreach programming for audiences of all ages.

The Insect Zoo also has been the recipient of the ongoing work of several students completing independent study projects, including Sara Maniscalco, from the NREM Department. Sara is producing a web-based video project, which will be accessible to educators and the general public to supplement K–12 classroom curriculum. Sara gained her media training and experience through serving in the Iowa Army National Guard.

During summer 2007, The Insect Zoo will collaborate with Springbrook Conservation Education Center to host an educators workshop called “Critters in the Classroom: Using Arthropods as Teaching Tools,” from July 22 to 24. A variety of topics will be covered during the event, including insect evolution, medical entomology, forensic entomology, arthropods in history, classification, and insect structure, and they will be designed around hands-on, self-discovery learning techniques.



News from Alumni

Jerome Klun, a USDA entomologist, published an article in the *Journal of Medical Entomology* (Klun et al., 2006, 43:1248) demonstrating for the first time that vapors from DEET function via the insect's olfactory system rather than acting when the insect contacts with the skin.

This work was featured in a News Focus article in the July 7, 2006 issue of *Science*.

Jerry earned his Ph.D. at Iowa State University in 1965 and worked in the Corn Insects Lab for several years before transferring to USDA at Beltsville, MD.

David Bartholomew, who acquired a master's degree in medical entomology in 1991 as a student of Dr. Wayne Rowley, worked for

10 years in the U.S. Navy's Medical Service Corps.

In 2006, he graduated from the University of South Dakota with a medical doctorate.

David has taken a position at Michigan State University in their General Surgery and Residency Program at Kalamazoo, MI.



David Bartholomew

Did you know?

In the department there are currently:

- 13 faculty
- 4 collaborators
- 1 affiliate and 2 adjunct faculty
- 1 lecturer
- 4 research associates
- 8 postdoctoral research associates
- 34 graduate students
- 10 undergraduates
- 6 undergraduate minors
- 1 account clerk
- 1 ag specialist
- 8 extension specialists
- 1 program assistant
- 2 secretaries
- 1 systems analyst

Keep in Touch!

Please let us know whether you have information to share with friends and alumni of the ISU Department of Entomology. Items could include job changes, honors and awards, and personal notes. Please direct information to Dr. Bryony Bonning, Department of Entomology, Iowa State University, 418 Science II, Ames, IA 50011-3222; Fax: (515) 294-5957; e-mail: bbonning@iastate.edu.

ISU Entomology Newsletter for Alumni and Friends is produced by the entomology faculty and staff at ISU. This newsletter and previous issues are online at

<http://www.ent.iastate.edu/alumni>

Visit our departmental web site at

<http://www.ent.iastate.edu>



Don Clayton Peters, 1931-2006

Don Clayton Peters who worked in the Department of Zoology and Entomology at Iowa State University from 1959 to 1970 died May 19, 2006, in Stillwater, OK, at the age of 74. He was born September 1, 1931, in Corn, OK. He graduated from Corn Bible Academy in 1949 and from Tabor College in Hillsboro, KS, in 1953 with a bachelor's degree in biology. He

attended Kansas State University from 1953 to 1957 and received his master's and doctoral degrees in entomology. After teaching at Tabor College in spring 1957, he became assistant professor of entomology at the University of Missouri. He joined the Department of Zoology and Entomology at Iowa State University in 1959. On January 1, 1971, he became professor and head of entomology at Oklahoma State University. He left administration in 1984 and focused on greenbug research specializing in host plant resistance to insects as influenced by insect genetics, behavior, and population diversity. He retired in 1997. Peters was active in the Entomological Society of America and served on the Governing Board from 1973 to 1976. The society elected him Honorary Member in 1999. He authored almost 100 papers and book chapters. Dr. Peters loved to tell people that just after becoming a full professor at Iowa State, his mother asked him, "When are you going to get a job?" She knew he had grown up enjoying playing with insects and therefore entomologists did not really work. Survivors include three children and four grandchildren.



Don Peters teaching entomology (date unknown).

James Thompson Griffiths, 1914-2006

James Thompson Griffiths died June 13, 2006, at the age of 91. Born November 4, 1914, in Alta Loma, Texas, Griffiths received an undergraduate degree in biology from Rice University and then a master's and a Ph.D. in entomology from Iowa State University. He married Anita Nethken, a graduate student at Iowa State, in 1939. She died in 1998. Griffiths taught at Iowa State and Auburn universities. Griffiths volunteered for the U.S. Army in 1943 and achieved the rank of captain. When the war ended, he accepted a job offer at the Lake Alfred Citrus Experiment Station, where he was a staff scientist from 1945 to 1951. He worked as a district and research manager for Lyon's Fertilizer Co., and then he oversaw roughly 6,000 acres of citrus while a manager for Eloise Groves Associates. From 1954 to 1963, he

was the general manager of Cypress Gardens Citrus Products. He then went to work for Florida Citrus Mutual as the organization's director of special projects from 1968 to 1981. After retirement, he became the managing director for Citrus Growers Associates, which represents the interests of mostly small- and medium-sized citrus growers. Griffiths acquired several groves during his time in Florida, and he was passionate about preserving agricultural land and water resources. He was highly regarded for his depth of knowledge and experience of the citrus industry. The week before his death, he was honored with the 2006 Citrus Achievement Award from Florida Grower magazine. Griffiths is survived by two sons, six grandchildren, and five great-grandchildren.

Randy Higgins, 1954-2006

Randall "Randy" A. Higgins was born in Greencastle, Indiana, on June 2, 1954, the son of Robert and Gloria Higgins. Randy earned a B.S. in entomology (Purdue University, 1976) and M.S. in entomology (Iowa State University, 1978). While at Iowa State, he earned a Ph.D. in 1982 under the mentorship of Larry Pedigo with majors in both entomology and agronomy, specializing in insect pest management and crop production/crop physiology. His dissertation title was "Soybean and velvetleaf development, yield, and management as affected by selected combinations of weed competition and simulated-insect defoliation."

In 1982, Kansas State University hired Randy as an assistant professor in entomology. He held a split extension (60%) and research (40%) appointment throughout most of his career. He earned the rank of associate professor with tenure in 1988 and the rank of professor in 1994. Randy served as extension state leader (1989–2002), interim entomology department head (1996–1997), and interim associate director for extension and applied research within the College of Agriculture (2002–2004). He served three terms as a faculty senator at Kansas State.

While at Kansas State, Randy guided 16 students to graduate degree completion. He authored and delivered hundreds of public and professional education publications and presentations. He was elected by his peers to the Governing Board of the Entomological Society of America. Randy was professionally recognized with the Entomological Foundation

Award for Excellence in Integrated Pest Management (2001) and the C. V. Riley Award from the North Central Branch (2003) for outstanding contributions to the science of entomology.

Randy worked tirelessly and selflessly to promote entomology and agriculture in Kansas. One example was a class he developed—Experience in Extension Entomology—which he taught nine times to graduate students. In 2000, Kansas State University recognized Randy's efforts with the Builder Award for excellence in working to improve research and extension efforts within the state.

On May 12, 2006, Randy died, by suicide, at the age of 51 near Manhattan, Kansas, on the shore of one of his favorite fishing lakes. He is survived by his wife, Mary, four children, and a granddaughter.

To those that knew Randy as a close friend or respected colleague, he will long be remembered as someone with a quick smile, a sparkle in his eye, a kind word for everyone, and a boundless level of energy. He will be greatly missed.

Marlin E. Rice



Randy Higgins

Entomophilately, continued from page 20

In 1964, Mali issued a series of stamps with the theme, "War against the locust." The most popular beneficial insect on stamps is the honey bee, with ladybird beetles second. The entomological subject matter depicted on stamps has the full range of accuracy of names, images, and overall aesthetic value. The insects

on some stamps are cartoons, whereas others are true works of art. Given my bias for both the quality and subject matter, I collect primarily British stamps depicting insects, natural history, and science.

Bryony Bonning

Faculty and Staff Awards

Nathan Brockman, butterfly wing curator at Reiman Gardens, received the Professional and Scientific Outstanding New Professional Award. This award recognizes a P&S staff member who has demonstrated outstanding accomplishments unusually early in his or her professional career at Iowa State. Nathan received a \$1,500 award.

Joel Coats was recipient of a major American Chemical Society (ACS) award: (see photo on front page of this newsletter).

James Oleson, Project Coordinator of the Corn Insect Management Project, was recognized by the College of Agriculture with a special achievement award for his work related to corn production in Iowa, given at the discretion of the dean in recognition of exemplary service to corn/soybean production in Iowa.



Jim Oleson receives his special achievement award from senior associate dean Joe Colletti.

Faculty/staff awards continue on page 18.

Opportunities to Give: Entomology Donations

With the ongoing budget constraints at Iowa State University, the Department of Entomology is increasingly dependent upon the generosity of alumni and friends. To support the department, please fill out this section and return it with your check or money order (made out to ISU Foundation) to the Department of Entomology, Iowa State University, 110 Insectary Building, Ames, IA 50011. Alternatively, donations can be made online at <https://sws.foundation.iastate.edu/give/online/> (specify Entomology and the area (shown below) in the "Other" category).

My support this year is in the amount of \$_____.

Please designate my gift to the area(s) in the amount(s) shown below:

- _____ Entomology Alumni Scholarship (undergraduate scholarships)
- _____ Wayne A. Rowley Scholarship in Entomology (graduate and undergraduate scholarships with preference given to those with an interest in medical entomology)
- _____ Biosystematics Travel Fund (travel costs associated with biosystematics research)
- _____ Fred Clute Memorial Entomology Fund (general support for the Department)
- _____ Entomology Memorial Fund (graduate student travel and awards)
- _____ Entomology General Account
- _____ Insect Zoo

For more information about these funds, please contact us at the departmental address above or call (515) 294-7400. For more information about other gift designations, please contact Richard Bundy, III, at (515) 294-9088 (rbundy@iastate.edu).



Awards

Faculty/staff awards, continued from page 17

Les Lewis was named the 2006 Agricultural Research Service (ARS) Senior Research Scientist of the Year for the Midwest Area for an outstanding career in research on integrated pest management of insect pests of corn. The purpose of this awards program is to annually

recognize the creative efforts, scientific leadership, and major research accomplishments of ARS research scientists.

John VanDyk received a certificate of appreciation in recognition of 10 years of service in ISU Extension.

Student Awards

The first recipient of the Wayne A. Rowley scholarship was **Brendan Dunphy**. This scholarship provides \$1,500 to students with preference given to applicants concentrating on medical entomology. Brendan is currently working in Dr. Lyric Bartholomay's lab (see article on page 12).

Rebecca Brown received the Department of Entomology Henry and Sylvia Richardson Research Incentive Grant for 2006. Rebecca received \$2,500 for research costs associated with the project entitled "Net-winged midges (Diptera: Blephariceridae) of Australia, with emphasis on Edwardsiniinae." Students write research proposals to compete for this grant. Rebecca will use the funds toward a collecting trip to Madagascar in 2007. Rebecca is a Ph.D. student in the laboratory of Dr. Greg Courtney.

The 2006 Department of Entomology Herbert Osborn Awardees for Professional

Performance were **Nicholas Schmidt** (M.S. category) and **Matt Petersen** (Ph.D. category). Nick conducted research with Dr. Matt O'Neal and Matt conducted research with Dr. Greg Courtney.



Matt Petersen

Awards from Iowa State University

Wendy Sparks of the Bonning lab received a 2006 Teaching Excellence Award through the Biology Program, which recognizes the top 10% of graduate student teaching assistants.

Other Awards

Kelsey Prihoda of the Coats lab was awarded runner-up for the Young Scientist Research Recognition Award from the Agrochemicals Division of the American Chemical Society.

Nicholas Schmidt won the outstanding M.S. student award given by the International Organization of Biological Control for his study of the natural enemy community within soybeans and their impact on soybean aphids.



Nick Schmidt



Rebecca Brown receives the Henry and Sylvia Richardson Research Incentive award from Dr. Bryony Bonning.



Scenes from the ISU Alumni Mixer at the 2006 ESA Annual Meeting



Denny Bruck (USDA, Oregon), Mike Gray (University of Illinois), Wendy Wintersteen (Iowa State University), Jim Gifford (Dow AgroSciences), and Robyn Rose (EPA, Washington, DC).



Clint Pilcher (Monsanto Company), Paula Davis (Pioneer Hi-Bred International), and Todd DeGooyer (Monsanto Company).



Back row: Brent Werner, Wayne Ohnesorg, Dave Dorhout, Jeff Bradshaw, Nick Behrens; front row: Gretchen (Schultz) Paluch, Nick Schmidt, Lindsey Gereszek, Melinda Thede, and Kevin Johnson (Iowa State University).



Scott Hutchins (Dow AgroSciences), Marlin Rice (Iowa State University), Tom Myers (All-Rite Pest Control, Lexington, KY), Mike Gray and Kevin Steffey (University of Illinois).

See more pictures from the mixer online at <http://www.ent.iastate.edu/alumni>

Student awards continued from page 18

Dan McCoy, a junior in entomology, was awarded the William F. Helms Memorial Scholarship. This scholarship provides \$5,000 along with paid employment during the summer and career opportunities with the USDA-APHIS-

PPQ department after graduation. Dan will be working in Iowa on monitoring pine shoot beetle (*Tomicus piniperda*). This year APHIS-PPQ put the state of Iowa under quarantine for this invasive pest.



Insect Zoo by Day, Search and Rescue by Night

As the Educational Program Coordinator, Angela Tague focuses on the Insect Zoo's mission to aid the citizens of Iowa in becoming more knowledgeable and interested in the world of insects. After hours, however, Angela focuses on training a four-legged vertebrate named Sage to aid the citizens of Iowa in a whole other way.

Two years ago, Angela joined STAR1 Search and Rescue; a Story County-based team, with the intent of becoming a ground searcher (SARTech II) and K9 handler. After 18 months, too many hours to tally, and countless training sessions, this past June, Angela and Sage became a deployable team upon completing their national level K9 SARTech III Area Search certification through the National Association for Search and Rescue. They will test again in spring 2007 for their Human Remains Detection certification. Angela also has become a national level SARTech II evaluator and passed



Angela Tague with Sage.

the Managing a Lost Person Incident certification.

Collecting without Endangering: Entomophilately

Stamps have been issued to celebrate the use of insects, to alert us of the battles against harmful species, to draw attention to those in danger, and simply to portray their diversity of form. Almost every country has issued stamps depicting insects. The earliest insect stamp was issued in 1891 by Nicaragua with a bee hive as part of a scene representing productivity and fruitfulness. It is estimated that two thirds of all insects featured on postage stamps (more

than 2,100 species from more than 165 families) are Lepidoptera. In 1999, there were 9,000 separate stamps issued with images of butterflies and moths. The first image of a butterfly on a stamp was in 1891 from Hawaii. The butterfly was in the hairpiece of Queen Liu-



uokalani, the last reigning monarch. In addition to the beautiful, the bad and the ugly of the insect world also have been featured. *Anopheles* figured prominently on world postage stamps in the early 1960s. In 1962, under the auspices of the World Health Organization and its malaria eradication program, many countries issued stamps honoring the effort.

Continued on page 16

