



The Dean's Musings

A Good Year

With the recent graduation of the Class of 1999 comes the opportunity to look back at the 1998-99 academic year. There was much to like. In fact, it was one of the best years of the past decade. Granted, the 1990s had a fair number of bumper years, particularly in the first half, but the past 4-5 years have seen a most welcome turnaround in fiscal solvency, which has resulted in enhanced academic initiatives. I offer here my thanks to the faculty, students, and staff who have done so much for CLAS in 1998-99.

A highlight of any year is the outstanding group of students who take degrees from CLAS. For example, among our undergraduates, we find that eight students completed their degrees with perfect 4.0 grade point averages, and another 61 students showed GPAs better than 3.90. This is not the result of grade inflation, as the CLAS average GPA has changed very little in the past 10 years. These students got their grades the old fashioned way; they earned them. Our graduate students do equally well, although we tend to focus more on their research accomplishments rather than classroom performance. Our new Gator graduates are finding ready opportunities in a receptive marketplace.

The faculty haven't done too shabbily themselves. Obviously, space here precludes even a partial listing of the prizes, awards, grants, and honors they have received, whereby they gain recognition for themselves, CLAS, and UF. Our faculty are involved in national and international studies of great significance. They are in constant demand from numerous agencies, foundations, and the press as sources of expertise and information.

We welcomed a new group of about 30 faculty last fall, and during 1998-99 we have recruited and hired another similar new faculty class to begin Fall, 1999. Of course, we lose some good faculty each

See *Musings*, page 12

CLASnotes

Vol. 14 The University of Florida College of Liberal Arts and Sciences No. 5

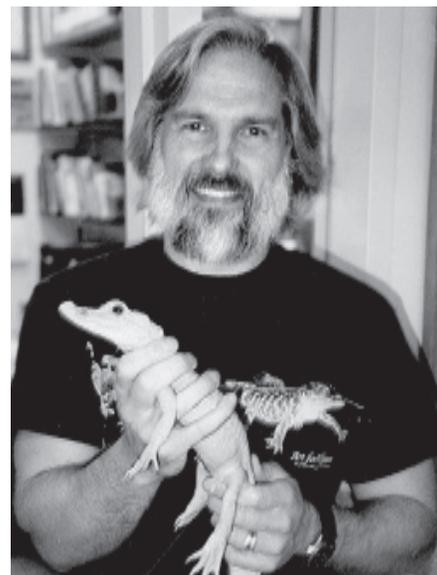
Alligators: Canaries in a Pesticide Coal Mine?

Chemicals that cause reproductive problems in gators pose similar risk to humans says CLAS zoologist Lou Guillette

Lou Guillette began conducting field research on Florida alligators in 1986. By the early 1990s he knew something was wrong. In collaborative efforts with the Game and Fish Commission and the US Fish and Wildlife Service, the CLAS zoologist had documented surprisingly low egg hatching rates and an unusually high incidence of birth defects. He'd found abnormal testosterone levels in male alligators and elevated estrogen levels and ovarian abnormalities, including growths called polyovular follicles, in females. The symptoms clearly indicated that Florida alligators were suffering from reproductive/endocrine disturbances, but why?

The pieces of the puzzle began to fit together during a 1991 visit from Guillette's "academic grandfather," Howard Bern (UC Berkeley). While at UF, Bern gave a talk on his work with a reproductive syndrome in humans called DES Daughters. The syndrome is caused by the synthetic estrogen DES, which, erroneously thought to prevent miscarriage, was prescribed to pregnant women from 1950s to the early 1970s. Interestingly, expectant mothers who took the drug developed no complications, but their female children exposed to DES in utero all later experienced altered fertility including increased spontaneous miscarriage and symptoms of polyovular follicles. "When [Bern] started showing various slides supporting his findings," says Guillette, "I realized that this was identical to what we were seeing in the alligators....So the question became 'Where in the world are alligators getting estrogens from?' And that's when we got on the trail that maybe these pesticides [that had run off or been spilled into Florida lakes] were estrogenic."

They were right. Like DDT, many of the most commonly used agricultural pesticides act as hormones, such as synthetic



Zoology professor Lou Guillette

estrogen, and can therefore adversely affect the endocrine and reproductive systems of living things exposed to them.

Taking a closer look at the effects of estrogenic pesticides made sense, since the lowest hatching rates (25% at that time) and highest incidence of birth defects were found in Lake Apopka, which, after years of agricultural run-off and a massive 1980 pesticide spill was (and still is) one of the most polluted lakes in the state. Conversely, hatching rates are nearer to 80% in Lake Woodruff, located in a wildlife reserve near DeLand.

Once they'd made the pesticide connection, it was time to rule out other causal agents. Guillette and his team brought uncontaminated eggs from the wildlife refuge into the laboratory and treated these eggs with the same pesticides they found in eggs from Lake Apopka. "The disturbing thing is that we've been able to recreate many of these problems [birth defects, low hatching

See *Guillette*, page 4

This month's focus: **Zoology**

Around the College

DEPARTMENTS

Anthropology

Paul J. Magnarella has edited a special issue of the journal *Human Peace and Human Rights*. The issue (v. 12, n. 1, 1999) is entitled "Justice, Peace and Human Rights: Anthropological Perspectives."

Center for African Studies

Michael Chege's article "Nigeria's Opportunity" was published in the March 15 *Christian Science Monitor*. Also on March 15, Chege gave a talk at the World Bank in Washington, DC on "Political Institutions and Economic Development in Sub-Saharan Africa" to a large group of World Bank officials currently working on a blue-print on economic reform in Africa (and the rest of the developing world) for the next millennium.

Chemistry

David A. Micha co-organized a "US-Latin America-Canada-Caribbean Workshop on Molecular and Materials Sciences: Theoretical and Computational Aspects," held in Cuernavaca, Mexico, on February 24-26. The Office of Naval Research, UF Division of Sponsored Research, and Quantum Theory Project cosponsored the workshop that was also sponsored by the Universidad Nacional Autonoma de Mexico and other Mexican institutions. This is the fourth workshop in a series started at the University of Florida. Several CLAS faculty members were invited speakers, and scientists and students from American countries gathered at the workshop to present results of common interest and to plan collaborations.

History

David Geggus gave the annual Elsa Goveia Memorial Lecture at the University of the West Indies, Jamaica, in April. His topic was The International Repercussions of the Haitian Revolution.

Physics

Greg Stewart has been elected to the Executive Committee of the Topical Group on Instrument and Measurement Science of the American Physics Society. This group oversees all aspects of instrument science and measurement for the physics society ranging from the award of a major prize to electing Fellows in this field to the APS. Stewart will serve on the committee until 2002.

UF Film Studies

Well Represented at National Meeting

The University's Film Studies programs had significant representation at April's Society for Cinema Studies conference, the discipline's principal meeting. **Greg Ulmer** (English) delivered one of the keynote speeches, and **Nora Alter** (Germanic and Slavic Studies), **Scott Nygren** (English), **Robert Ray** (English), and **Maureen Turim** (English) also gave papers. English Department graduate students Tom Cohen, Tracey Cox, Eric Faden and Mary Wiles gave papers, as did English graduates Christian Keathley (MA), Kathleen McHugh (MA), and Alan Wright (PhD).

New Physics Building Wins City Beautification Award



At an April 21, 1999 Ceremony held at the Thomas Center, Gainesville Mayor Pro-Tem Pegeen Hanrahan presented a City Beautification "Gold" Award in the Institutional Facilities category to the new Physics Building. **Liz Seiberling** (Physics) accepted the award on behalf of the department and college.

The City Beautification Awards, designed to recognize projects of outstanding aesthetic and artistic appeal, are given annually by the City Beautification Board. Projects are evaluated on originality, innovation and creativity, as well as long-term strategy, maintenance and serviceable materials. Sites must exhibit appropriate use of land and effective planning and must result in the improvement of the surrounding area, property or neighborhood. An anonymous student nominated the Physics building for the award.

Classics Courtesy Professor Dies at 84

Classics courtesy faculty member **Jay Deiss** (associated with UF since 1983) passed away on April 10. He was 84 years-old.

"I know all of us in Classics will feel the loss of this charming, witty and learned gentleman who joined us on so many happy departmental occasions, and who maintained such a long-standing and active interest in the Classics Department," says Classics Chair **Lewis Sussman**. "He will be greatly missed."

Outstanding CLAS Staff Members Recognized

Each year, UF gives superior accomplishment awards to faculty and staff who have been nominated by colleagues for performing above and beyond the call of duty. Awards are made in four categories: faculty, A&P, USPS and technical staff. At the divisional level, CLAS had winners in two of these four areas:

Beth Boone (Physics), Clerical/Office Support

Linda O'Donnell (Academic Advising), Clerical/Office Support

Todd Prox (Chemistry), Administrative/Supervisory

Barbara Walker (Chemistry), Administrative/Supervisory

Six university-wide Superior Accomplishment Awards (\$1,000) and six additional awards (\$500) will be announced at a June 1st ceremony to be held in the Reitz Union Ballroom.

Around the College

Zoology Grad Students Named NSF Fellows

Two Zoology graduate students, **Brian Riewald** and **Manuel Velez** received National Science Foundation Predoc-toral Fellowships this month. These highly competitive, national Fellowships provide full funding for a 4-year PhD program.

Brian received his undergraduate degree from the University of Virginia and is now studying with **Karen Bjorndal** (Zoology). His PhD research is a study of where pelagic, juvenile sea turtles are located with respect to biotic and abiotic oceanographic features and whether they are passive or active in their choice of an environment. The study will involve satellite tracking telemetry, remote-sensing, and the Geographical Information System to follow young turtles during their early years.

Manuel received his undergraduate degree from Cornell University and is now studying with **Jane Brockmann** (Zoology). His MS research is a study on the parental care behavior of a cichlid fish living in streams in Panama and the factors that influence male desertion of the nest. This summer Manuel will begin his PhD research, a study of how the mechanisms of female choice affect the evolution of male secondary sexual characteristics in the field cricket *Gryllus rubens*.

CLAS Historian Wins NEH Summer Stipend

Fred Corney (History), nominated by a faculty committee from the Humanities divisions of CLAS and Fine Arts, will receive a \$4,000 National Endowment for the Humanities summer stipend. For the 1999 competition, UF was allowed to submit only one proposal, down from two in years past. This marks the fourth year in a row that at least one CLAS faculty member has been chosen in this very competitive program.



CLAS Chemist Named Cottrell Scholar

Chemistry professor **Weihong Tan** has just been named a 1999 Cottrell Scholar. The award, given annually by the Research Corporation to only 13 academics nationwide, seeks to recognize faculty who excel in both teaching and research. The award comes with a \$50,000 stipend to further recipients' work. CLAS Chemist **Jeffrey Krause** received the award last year.



Six CLAS Graduates Recognized by Alumni Association

During each University of Florida Commencement Ceremony, the UF Alumni Association recognizes and awards outstanding graduates for their scholarship and service. Of the 14 students recognized May 1st, six were from the College of Liberal Arts and Sciences:

Marisa N. Roberts (Zoology and Women's Studies) was named outstanding female leader "for her remarkable service to the UF community." **Dorsey C. Miller** (Political Science) was chosen as outstanding male leader "for his service to Omega Psi Phi fraternity, the National Panhellenic Council, student government and volunteer organizations on campus." Hispanic Student Association President **Gilberto Sanchez Valencia** (Political Science) was also chosen as outstanding male leader for "his extensive service to campus organizations and the community."

Gina M. Slinger (Geography) and **Tuan Tran** (Zoology) were named four-year scholars for maintaining perfect 4.0 grade point averages, and **Eynat Tauber** (Psychology) was named two-year scholar for maintaining a 4.0 after transferring in from the Broward Community College Honors Institute.

Promoted Professors

Congratulations to the following CLAS professors and technical staff who were recently recommended for promotion:

Distinguished Professor

Patricia Craddock, English
Goran S. Hyden, Political Science
Pierre Ramond, Physics

Full Professor

W. Fitzhugh Brundage, History
Will Hasty, German and Slavic Studies
David M. Hedge, Political Science
Peter J. Hirschfeld, Physics
Alan Spector, Psychology
Li-Chien Shen, Mathematics

Associate Professor

Cheng Hai-Ping, Physics
Anthony Falsetti, Anthropology
Pamela Gilbert, English
Susan Hegeman, English
Benjamin A. Horenstein, Chemistry
Debra King, English
Amitava Kumar, English
Barbara McDade, Geography
Irma McClaurin, Anthropology
Mohammad Mohammad, African and Asian Language and Literature
Mark Thurner, History
Eldon R. Turner, History
Manuel Vásquez, Religion

Tenured

Michael Binford, Geography
Richard J. Elston, Astronomy
Stephen Mulkey, Botany

Full Scientist

David H. Powell, Chemistry
Ben Smith, Chemistry



UNIVERSITY OF
FLORIDA

CLASnotes is published monthly by the College of Liberal Arts and Sciences to inform faculty and staff of current research and events.

Dean: Will Harrison
Editor: Jane Gibson
Asst. Editor: Ronee Saroff
Graphics: Jane Dominguez

<editor@clas.ufl.edu>

Guillette, *continued from page 1*

rates, endocrine and reproductive dysfunction] in the lab using chemical concentrations equal or lower than concentrations found in Apopka eggs,” says Guillette. “In fact, the EPA, the CDC and others have now taken note because the blood levels of pesticides that have caused abnormalities in alligators are similar to levels seen in the blood of many humans. We’re talking about quite low concentrations.”

Guillette admits that many are unwilling to accept the idea that his alligator data is relevant to human health. But the UF zoologist maintains that his primary research question, “How do man-made chemicals affect embryonic development?” has implications beyond wildlife. “People are shocked when I tell them that humans and alligators have the same hormones,” he says. “We’re not as different or unique as we like to think.”

If alligators and other wildlife are the canaries in the pesticide coal mine, research like Guillette’s may dramatically transform public policy. Guillette currently sits on three policy panels, one for the European Community, one for the Japanese Government, and one here in the US for the National Academy. “We are trying to understand where current policy fails in its understanding of the biological risk or significance of using these types of compounds,” he explains. Panel members reevaluate why and how we use chemicals and what appropriate endpoints should be when calculating the risks associated with these chemicals. “Traditionally we’ve used things like cancer and death or major birth defects (arms and legs in the right place and the right number of eyes) to determine problems,” says Guillette. “Those are still perfectly good endpoints because none of us wants those things to happen, but the question we’re now asking is, are there subtler effects (subtle only in their ability to be detected, not subtle in how they might influence the organism) that we need to recognize as important endpoints in gauging the safety of these chemicals. For example, what happens if your immune system is suppressed by 15% or 20% your whole life? You have 15-20% more colds and flu and your chance of developing cancer increases by 15-20%. What happens if your child’s intelligence is lowered by 10 IQ points? Is that considered detrimental? Or let’s say it doesn’t alter IQ but your attention span or your memory, or your ability to interact with others so that socially you have difficulty relating with colleagues and friends...if you can even make friends at all.”

It’s not that we should ban all chemicals, stresses Guillette. But if we do choose to use chemicals in our society we need to know what the real costs are. At present, he maintains, chemical companies only tell the public how much is going to come out of their pocketbooks at the cash register. They don’t discuss what the ecological or public health costs are. “Flip over a bag of lawn chemicals and read the warning signs: ‘Don’t use in

house,’ ‘Don’t use on lawn next to water or lake,’ ‘Toxic to fish’ or ‘Toxic to wildlife,’” he says. “Do we think that somehow humans are exempt? What’s the difference between a bird or fish cell and yours? There is none. We don’t understand the implications these chemicals have for developing embryos—whether developing fish, frogs, or human beings.”

Convincing the public of potential risks, however, can be difficult. “We all take drugs for headaches or other problems,” points out Guillette. “These drugs were tested in some kind of animal model before they ever got to us. So on the one hand, we believe that animal reactions to pharmaceutical chemicals can give us valuable public safety information, but if you try to do the exact same thing with pesticides or environmental chemicals the argument you get back is ‘Oh, I’m sorry that’s animal data. You can’t say that would happen in humans.’ It’s a real Catch-22.”

Nevertheless, the Florida scientist feels it’s part of his job as a state educator to try to help society understand what the implications of his research are. “Many university professors and researchers are doing this,” he says. “We are public servants. We’re paid by the state, and it’s important for us to speak out when we see something that constitutes either a good or a bad for society.” Accordingly, Guillette gives up to 50 talks around the world each year, writes articles for both academic and lay publications, does interviews and TV segments for national media, sits on environmental policy panels and works locally in the public school system.

Despite these sweeping efforts, Guillette’s goals are modest: “My major goal as a scientist is to leave a legacy of people. I have no idea what the significance of my own work will be five or 10 or 50 years from now—or whether my work will even end up being significant. But I think that my legacy to science will be the students and the people I help to become scientists themselves.”

And of course he also hopes that work like his will eventually make a lasting impression on lawmakers. “If we can argue in Washington that public health is equal to economic health, then I’ll be really happy,” he says. “Look at the epidemics in this country. The ones we don’t speak about: endometriosis, fibroids, prostate disease, breast cancer. They are all diseases of hormones. The question is what’s happened to our endocrine systems? Look at attention deficit disorder in children or abnormalities in growth in wildlife. When you start adding these things up, you realize there are some major concerns and problems here. One of the arguments that I’ve made for years in Washington is a lack of data does not mean a lack of effect. A lack of data just means we don’t know. And the more we admit we don’t know, the more people like me will be stimulated to find the answers.”

Grants, *continued from page 9*

State \$198,246

Telesco, C.	AST	Assn.of Univ.for Res.in Ast.	198,246	Design, Fabrication and Commissioning of the Mid-Infrared Imager for the Gemini 8-M Telescopes
Kisko, T.				

Miscellaneous \$10,700

Thomas, C.	CRIM	Multiple Sources	8,500	Private Corrections Project
Calvert Hanson, L.				
Scicchitano, M.	POLISCI	Multiple Sponsors	2,200	Outside Applied Research for Surveys

Sea Turtle Research Thrives at UF

An interview with zoology professor Karen Bjorndal, Director of the Archie Carr Center for Sea Turtle Research

Cn: What is the mission of the Archie Carr Center for Sea Turtle Research?

KB: In our very active program we continue to emphasize research, conservation of sea turtles, and graduate student education. We also emphasize international work. One of our six graduate students is about to head off to Morocco, another to the Dominican Republic, and another to spend a year and a half in the Bahamas. We have an ongoing exchange program with Brazil and a very active exchange program with the University of the Azores, as well as extensive work going on in the Bahamas. Our major focus is research, but we try to design our research so that the results have important management implications.

The work of one of our graduate students, Blair Witherington, is a good example. Blair was very interested in how turtle hatchlings perceive light, so for his dissertation he undertook that study, but he also was able to develop some solutions to a very serious problem. When hatchlings emerge from the nest, they orient towards the horizon of greatest illumination. Under natural conditions that is always the ocean. A major problem wherever beachfront property has been developed is that the lighting behind the beaches disorients the hatchlings. In the case of Florida, every year thousands of hatchlings were being disoriented out to highway A1A and getting smashed by cars, being eaten by dogs, or dying of exhaustion or desiccation. Blair was able to discover that there is a single, monochromatic wavelength of light in the yellow zone which does not attract sea turtles. Es-

sentially, they either do not perceive it or they actually avoid it.

Much beach lighting now has been switched over to utilize this type of low pressure sodium light. Florida Power and Light, for example, when replacing lamps behind sea turtle nesting beaches, uses the new lighting. I always like to use Blair's work as an example, because he discovered some wonderful things about the basic biology of light perception and response to behavioral cues in loggerhead turtles, but in addition, he had a tremendous impact on management options. While writing his dissertation, Blair received faxes, e-mail and telephone calls from as far away as Italy, Greece, and Malaysia. Internationally, people were very anxious to incorporate his results into their regulations for beachfront development. His results were the basis of many laws that have been established in sea turtle nesting countries throughout the world.

Cn: What's next for the Center?

KB: We have a real interest in doing more in-water research with sea turtles. The vast majority of work that has been done up to the last few years has been on nesting beaches, but that leaves about ninety-nine percent of their life cycle out in the water totally unexplored. It is much more difficult, more time-consuming, and more expensive to study turtles in the water, because when they leave their nesting beaches to go to their foraging grounds, they become widely dispersed and the encounter rate is much lower.

The Center has one of the earliest in-water studies. Actually, I started the project for my

dissertation in the mid-70s in the southern Bahamas. Alan Bolten (Zoology) and I go back there every year and have been monitoring this long-term population. We have conducted research on growth rates, foraging ecology, movements, and have been making real progress there. But we need to do a lot more work.

Cn: What are the Center's future goals?

KB: We would like to obtain support for some Center-wide projects. One that we are particularly interested in is taking a broad approach to the epidemiology of a very serious disease in green turtles that has increased dramatically in the past ten to twenty years. The disease is called fibropapillomatosis and involves the growth of nonmalignant tumors that we believe are caused by a herpes virus. UF's Paul Klein (College of Medicine) and Elliott Jacobson (College of Veterinary Medicine) are the world's leading experts in this disease. They are trying to isolate the causative agent. They have made tremendous progress, but reptile herpes viruses are extremely difficult to culture. Meanwhile, the disease has continued to spread throughout the world. It used to be known only from green turtles. Now we know that it is also occurring in some of the other species of sea turtles, which is a real concern. We would like to take a very broad approach, working from many angles including nutrition, migration patterns, and genetics, to try to understand how it has become such a massive problem and how we can counteract it. Again, this would be a project that would have tremendous potential for



Karen Bjorndal

learning about basic biology, but also tremendous management and conservation implications.

Cn: What do you see as the Center's biggest strengths?

KB: Although based here in Zoology, the Center is very broadly represented across campus. We have an executive committee that is composed of faculty from IFAS (Brian Bowen and Ray Carthy), the College of Medicine (Paul Klein), the College of Veterinary Medicine (Elliott Jacobson), and CLAS (Alan Bolten and myself). We have a very interactive program. We work at all scales from the molecular to the global, so that we are actively involved in questions of molecular genetics—with Brian Bowen taking the lead—and trans-oceanic migrations monitored with satellite telemetry, which is Alan Bolten's specialty. We are fortunate to have the greatest diversity and concentration of researchers studying sea turtle biology of any place in the world. It's also terrific that we all get along really well and enjoy working with each other—it's a real delight. 🐢

Grant-supported, the Archie Carr Center for Sea Turtle Research receives most of its funding from private foundations and federal agencies. Recent corporate donors include Disney, the Ted Turner Foundation and Royal Caribbean Cruise Line's Ocean Fund.

Undergraduate Research Symposium



On April 10, 18 students and their faculty mentors participated in the 9th Annual CLAS Undergraduate Research Symposium, which provides interested scholars the opportunity to practice presenting their work in a symposium-like setting. At the luncheon following the symposium, participants were presented with plaques by Dean Harrison, and based on written and oral excellence, three students were awarded \$100 cash prizes. Four faculty mentors were also recognized and awarded.

Participants in the 1999 Symposium

Student

Maria Teresa Baquero

Alan J. Bliss

Trey Conner

Michael B. Fitts

Cara Grasso

Marc J. Inglese

Deborah Jensen

Doug Knox

Thomas L. Kukar

Theodore A. Martinot

David John Masiello*

Jennifer Rebecca Miles

Nicole Pasricha

Joseph R. Pigg

J.A. Saarinen

Jennifer A. Slattery*

Katie Townsend*

Tuan M. Tran

Mentor

Robert J. Cohen (Molecular Biology)
and Richard Moyer (Molecular Genetics)

Robert Zieger (History)

James Paxson (English)

Geoffrey Giles (History)

Lisa McElwee-White (Chemistry)

Louis J. Guillette** (Zoology)

Daniel Talham (Chemistry)

Brandon Kershner** (English)

Michael R. Bubb (Microbiology)

Tomas Hudlicky (Chemistry)

Scott McCullough (Mathematics)

and Joseph Simmons (Material Science)

Chuck Peek (Sociology)

Amie Krepple (Political Science)

R.A. Shoaf (English)

Michael Binford (Geography)

Louise Newman** (History)

Michael Binford** (Geography)

Jill Verlander Reed (Nephrology)



(clockwise from top left) Student-winner Jennifer Slattery presents her research "Between the Essence and the Decent." Dean Harrison congratulates student-winner David Masiello. Brandy Kershner (English), pictured with Harrison, won a faculty mentor award along with Mike Binford (Geography), Lou Guillette (Zoology) and Louise Newman (History). Student winner Katie Townsend relaxes with her mom between symposium sessions.

*Student Winners; **Faculty Honored

Tenth Annual Public Speaking Students Forum



(from left) Parisa Hamzetash, Kelly Greeno, Cherice Douglas, Sarah Cote, Tammy Nanek and Risa Behar competed in the Dial Center's Public Speaking Students Forum on March 29th.

The Tenth Annual Public Speaking Students Forum, sponsored by the William and Grace Dial Center for Written and Oral Communication and McGraw-Hill Publishing was held on March 29. Six student speakers, nominated from over 500 students enrolled in the introductory public speaking course this past year, competed in the event. Subject areas included gun violence, healthcare, shaken baby syndrome, adoption by homosexuals, seatbelt use, and the healing power of laughter.

Cash awards were presented to the top three speakers: first place (tie)—**Parisa Hamzetash** (Accounting) and **Sarah Cote** (Business); second place—**Risa Behar** (Exercise Physiology); and third place—**Cherice Douglas** (Political Science).

The event's judges were **Glenn Butler** (Journalism), **Jane Douglas** (Dial Center), **Slade Dukes** (President, UF Speech and Debate Team), **Jeanna Mastrodica** (Academic Advising), and **David Zolotow** (McGraw-Hill). **Gerald Kish** (Dial Center) was master of ceremonies. A reception in the Reitz Union followed the event.

The Nature of Ecology

By CLAS ecologist and zoology professor
Craig Osenberg

“Ecology” means different things to different people: “environmentalism” to the idealistic undergraduate (and most journalists and the public at large), “natural history” to the avid bird watcher, and “inexpensive” to many university administrators. It is, of course, none of these. Ecology is an integrative scientific discipline concerned with the dynamics that result from interactions among organisms and their environments. The dynamics are defined at a variety of scales (e.g., from physiological mechanisms up to community structure, from small-scale experiments to large-scale patterns, and from short to long-term dynamics), and ecologists, along with evolutionary biologists, seek to develop theory that organizes and explains the diversity of life and the patterns that emerge across different biological systems.

The complexity of nature provides us with endless patterns to explain; complexity, however, is also our affliction. Ecosystems consist of hundreds (if not thousands) of different species. Each species is itself extremely heterogeneous, consisting of individuals that can differ in their ecology (e.g., due to differences in age, size, or genotype) as much as can members of entirely different species. Because ecologists deal with heterogeneous systems, whose dynamics operate at different scales, ecologists must rely on a suite of tools and approaches; we are jacks-of-many-trades and seldom masters of a single technique. We not only often require high-tech tools (GIS, image analysis, laser-ablation

ICPMS, DNA sequencing), but also a fleet of field vehicles and access to field laboratories and study sites with restricted public access (lest our equipment and experiments disappear). We also must be strongly quantitative, not only in the way we design experiments and evaluate the relative contributions of different ecological processes, but also in the way we apply statistical and mathematical models to make inferences about ecological dynamics.

My research and teaching programs emphasize the integrative and quantitative nature of ecology. I work in lakes and nearshore marine systems (e.g., the Florida Keys), and my research involves both laboratory and field study, experiments and observation, and real systems as well as mathematical models. My primary area of expertise is in the ecological effects of population “stage-structure.” For example, fishes (and most other organisms) grow appreciably in size, and, as a consequence, the nature of their interactions with other species changes dramatically over their life time: largemouth bass compete with bluegill early in their life history but later prey upon them.

My colleagues and I have documented that the dynamics of these structured systems are grossly different than those of unstructured (i.e., homogeneous) systems, upon which most ecological theory is still based. Stage-structure also has implications at larger spatial scales: e.g., my research shows that bluegill, which shift habitats during their life history, couple the dynamics of nearshore (vegetated) habitats and offshore (open-water) habitats, which historically have been studied as if they represented two independent systems.

The implications of population structure are perhaps most compelling in applied settings; indeed, some of the classic “mistakes” in fisheries management have arisen through ignorance of stage-structured dynamics. To that end, Colette St. Mary (Zoology), Jacqueline Wilson (a graduate student in my lab) and I have begun projects looking at stage-structured interactions in marine fishes

and the implications for the conservation of these fishes and the design of marine reserves. In this work, and my applied

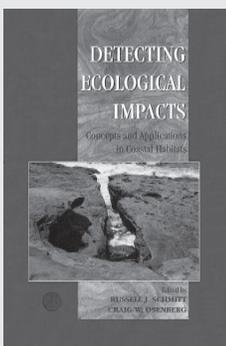
work on the statistical design of impact assessment studies, my first priority is to contribute to the theoretical foundations of the field. Indeed, this primary emphasis on theory (and the secondary emphasis on its application) is what uniquely distinguishes the Zoology (and Botany) Department from other biological programs on UF’s campus. We provide the theoretical foundation in ecology and evolutionary biology necessary for the applications emphasized in other departments at UF.

Because of the uniqueness of each ecological setting, few ecological results can be “replicated.” Instead, the heterogeneity of results becomes, itself, a template for research. The advancement of general theory lies in well-reasoned, quantitative synthesis that reveals the factors that account for these differences in results. To that end, I have championed the integration of ecological models and meta-analysis (the quantitative and statistical comparison of results from many different studies) as a powerful synthetic tool. I have accomplished much of this work through invitations to join and/or lead working groups sponsored by the National Center for Ecological Analysis and Synthesis (an NSF-sponsored center in Santa Barbara, California), which has culminated in a forthcoming Special Feature in the journal, *Ecology*. I also emphasize these issues in my graduate course, “Quantitative Methods and Ecological Inference.”

If you are interested in learning more about my research and teaching program or the Zoology department in general, I encourage you to check out our Web site—my personal page can be accessed at www.zoo.ufl.edu/osenberg.



Craig Osenberg



Osenberg co-edited *Detecting Ecological Impacts: Concepts and Applications in Coastal Habitats*, a rigorous treatment of statistical, conceptual, and administrative issues related to the quantification of human impacts on ecological systems.

Exploring Marine Larvae

Zoology professor Larry McEdward discusses his recent work with marine larval development.

My interests are in the evolution of larval development patterns in marine organisms. Marine larvae are radically different from their adult counterparts, in morphology, habitat, and mode of nutrition. Marine larvae are particularly interesting because they must function as planktonic organisms and, at the same time, undergo very rapid and extensive developmental changes. What fascinates me and motivates my research program, is the fact that for all of the morphological, taxonomic, and ecological diversity that exists among the more than 30 phyla of marine animals, there are only three major patterns of larval development. What evolutionary factors have led to the origin and persistence of these patterns? What drives evolutionary transitions among these patterns? Through my research, I seek a deeper understanding of the evolution of life cycles by integrating the fields of evolutionary developmental biology, larval ecology, and life-history theory.

One of the most striking patterns in larval ecology is the existence of only two modes of larval nutrition. In planktotrophy, eggs are very small and larvae require exogenous food (e.g., phytoplankton or other small food items) for development. In the alternative strategy (lecithotrophy), eggs are very large and development is fueled entirely by endogenous reserves originally provided in the egg. The current paradigm for larval ecology is based on theory that predicts two distinct modes of larval nutrition (i.e., complete reliance on external food items, or complete reliance on internal energy stores). This theory has proven difficult to test empirically. In collaboration with colleagues at the Friday Harbor Laboratories (University

of Washington), we experimentally reduced egg size by isolating single cells from early embryos of sea urchins to mimic the effects of an evolutionary modification of egg size. Our work provided the first definitive demonstration of the causal relationship between egg size and early life-history traits in marine benthic invertebrates. Using manipulations of egg size, controlled feeding experiments, and analyses of larval growth, here at the University of Florida and at the Keys Marine Laboratory, we discovered a

wide range of larval feeding requirements in subtropical sea urchins and sand dollars. We have shown a direct link between the level of resources provided by the parent in the egg and the degree of dependence on food by the larvae. Furthermore, the degree of dependence on food seems to be inversely correlated with the capacity for facultative feeding (i.e., the ability to acquire food before it is necessary for continued development).

I have developed computer models of larval evolution that include facultative larval feeding, based on our experimental results. The new models show that maximal reproductive success

can be achieved at intermediate egg sizes, depending on food supply and mortality rate. A diversity of nutritional strategies, such as we observe in subtropical sand dollars, is predicted. We have recently begun a new project to measure the effects of facultative feeding on larval development and growth and to develop new models that link adult reproductive strategies, larval energetics, and postmetamorphic juvenile success. This represents a first step towards our long-term goal of building whole life cycle models. ☺



McEdward, in northern Puget Sound with *Pycnopodia helianthoides* (starfish).

Zoology Office Staff



Program Assistant **Karen Kafouse** (left) works in the main Zoology office (Bartram 223). Office Manager **Kanetha Johnson** (far right) and Secretary **Tangelyn Mitchell** (right) work in the Biological Sciences division of Zoology (Carr 210).



Grants

(through the Division of Sponsored Research)

March 1999 Total: \$2,609,603

Investigator Dept. Agency Award Title

Corporate \$132,566

Katritzky, A.	CHE	Energy Biosystems Inc	4,200	Collaborative Work in Sulfur Chemistry
Katritzky, A.	CHE	Multiple Companies	2,866	Software Research Support
Katritzky, A.	CHE	Multiple Companies	3,000	Miles Compound Contract
Powell, D.	CHE	Dow Chemical Company	5,000	Mass Spectrometry Services
Schanze, K.	CHE	Am Chemical Society	3,359	ACS Editorship
Scott, M.	CHE	Am Chemical Society	25,000	Tripodal Aryloxides-Rigid Platforms for the Preparation of Large Constructs
Wagener, K.	CHE	Dow Chemical Company	49,334	Modeling Polyethylene Crystallization
West, R.	PSY	Retirement Research Foundation	16,022	Student Research and Mentoring Awards in Adult Development and Aging
Carter, R.	STA	Agency for Health Care Admin	13,785	Birth Vital Statistics: Survival Low Birth Weight and Morbidity Outcomes Research
Chapman, L.	ZOO	Wildlife Conservation Society	10,000	Recovery of Plant and Animal Communities in the Kibale Corridor
Chapman C.A.				

Federal..... \$2,231,841

Anton, S.	ANT	NSF	1,550	Australian Cranial Traits: Function, Development, and Modern Human Origins
Boinski, S.	ANT	NSF	40,541	Squirrel Monkeys: A Test of Primate Social Evolution Theory
Burns, A.	ANT	NSF	2,000	Graduate Research Fellowship Program-Cost of Education Allowance
Elston, R.	AST	Natl. Optical Ast. Observatory	100,000	Flamingos Time on the Kitt Peak National Observatory (KPNO) Telescope
Gustafson, B.	AST	NASA	40,000	Optical Properties of Irregular Dust Particles: Experiment and Theory
Lada, E.	AST	NASA	69,900	Towards a Complete Inventory of Star and Planet Formation Activity in Nearby Molecular Clouds
Ewel, J.	BOT	NSF	15,000	Sustainability of Soil Fertility in Tropical Ecosystems
Jones D.A.				
Harmon, A.	BOT	NSF	80,000	Characterization of Proteins that Interact with CDPK
Benner, S.	CHE	NASA	61,864	Darwin Chemistry
Benner, S.	CHE	NIH	214,052	Non-Standard Base Pairs as Biomedical Research Tools
Duran, R.	CHE	NSF	11,096	Research Experiences for Undergraduates in Chemistry at the University of Florida
Duran, R.	CHE	US DOE	212,008	Instrumentation for the MRCAT Undulator Beamline at the Advanced Photon Source
Harrison, W.	CHE	US DOE	95,000	The Glow Discharge as an Atomization and Ionization Source
Horenstein, B.	CHE	NIH	145,695	Reaction Coordinate Analyses of Uracil DNA Glycosylases
Kennedy, R.	CHE	NIH	125,724	Design and Use of Methods for Peptide Secretion Studies
Kennedy, R.	CHE	NSF	130,000	Affinity Interactions in Capillary Separations
Reynolds, J.	CHE	US Navy	65,000	Synthesize Dimers of Alkylenedioxy Thiophene and Monomers for Stable N-Dopable Electrically Conducting Polymers
Reynolds, J.	CHE	US Navy	5,000	Partial Financial Support of the 1999 American Chemical Society Chemistry of Materials Award Symposium
Richardson, D.	CHE	US Army	85,000	Catalytic Oxidation of Mustard Simulants in Basic Solution
Schanze, K.	CHE	NASA	50,003	Chemically Tailored Particles for Wind-Tunnel Seeding
Scott, M.	CHE	NSF	99,500	Career: Tripodal Aryloxide Ligands: From Molecular Receptors to Organometallic Catalyst
Scott, M.	CHE	NSF	47,000	An REU in Chemistry at the University of Florida
Duran, R.				
Yost, R.	CHE	EPA	28,614	Development of Methods for the Analysis of DBPS in Biological Samples and Their Application to Human Kinetics
Martin, J.	GEO	US DOC	23,099	Modern Fluid Venting and Its History: Monterey Bay, Ca
Alter, N.	GSS	NEH	30,000	The Essay Film: Between Feature Film and Documentary
Bao, G.	MAT	NSF	17,100	Modeling and Optimal Design in Micro-Optics
Hager, W.				
Garvan, F.	MAT	NSA	5,000	Conference: Symbolic Computation Number Theory Special Functions Physics and Combinatorics
Hager, W.	MAT	NSF	44,999	Discrete Approximations in Variational Problems
Andraka, B.	PHY	US DOE	40,000	Non-Fermi-Liquids and Magnetism of Heavy Fermions
Dufty, J.	PHY	US DOE	59,000	Charge Dynamics in High Energy Density Matter
Hirschfeld, P.	PHY	NSF	6,000	Disordered Electrons in D-Wave Superconductors
Ingersent, J.	PHY	NSF	69,000	An REU Site in Physics at the University of Florida
Dorsey, A.				
Maslov, D.	PHY	NSF	52,122	Three-Dimensional Low-Density Metals in Ultraquantum Magnetic Fields: Search for Instabilities
Graybeal, J.				
Ramond, P.	PHY	NSF	3,000	Higgs and Supersymmetry: Search and Discovery
Stanton, C.	PHY	US DOE	44,403	Quantum-Confinement Effects and Optical Behavior of Intermediate Semiconductor Clusters
Sullivan, N.	PHY	NSF	49,708	Field-Induced Relaxation of Spin Currents in Dilute Fermi Liquids
Adams, E.				
Bjorndal, K.	ZOO	US DOC	24,500	Green Turtle Grazing: Effects on Productivity and Biodiversity in Seagrass Ecosystems
Bolten, A.				
Bjorndal, K.	ZOO	US DOC	35,363	Cooperative Marine Turtle Tagging Program
Bolten, A.				
Brockmann, H.	ZOO	NSF	4,000	Graduate Research Fellowship Program - Cost of Education Allowance

Foundation \$36,150

Chen, K.	AST	Wood Fund	1,000	Computer Recording of the Card Catalogue of Photometric
Andrew W.				
Mukherjee, J.	AST	R.J. Weyhrich Leadership Fund	5,000	LDR Fund Astronaut Michael Collins Space Exploration Leadership Scholarship
Dermott, S.				
Mulkey, S.	BOT	UF Foundation	27,000	Canopy Biology Program in Panama
D'Amico, R.	PHIL	UF Foundation	3,150	Department of Philosophy General Fellowship Account

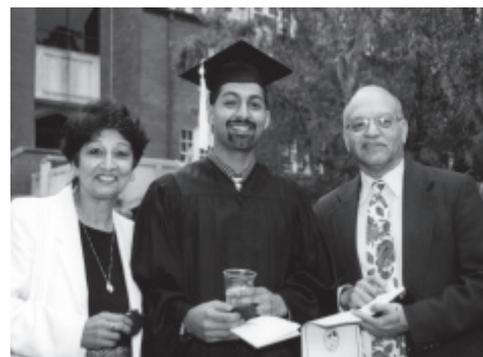
See Grants, page 4

Baccalaureate 1999

The 17th Annual CLAS Baccalaureate Ceremony was held Friday, April 30, in University Auditorium. Two hundred CLAS graduates drew family, friends and faculty together to celebrate Spring Commencement. During the program, Dean Harrison introduced top CLAS scholars and faculty, the Gainesville Civic Chorus performed, Tony Randazzo (Geology) honored retiring faculty and President Lombardi spoke of the flexibility of a CLAS degree.



(top row, from left) **Andrea Kvasnak** (Math) gets help with her regalia from her mom. UF Advising Award winner **Glenn Kepic** (AAC), pictured here with Advising Director **Al Matheny** (Political Science), was one of many award-winning CLAS faculty members recognized during the program. (second row, from left) Eight CLAS students graduated with a perfect 4.0, including **Alyson Finkelstein**, who gave the Valedictory Speech. Psychology graduates **Melissa Masterson**, **Jami Phillips** and **Kathleen Leong** share a final moment together as UF students. Faculty preparing for the ceremony: **Brian McCrea** (English), **Alan Burns** (Anthropology) and **Mike Gannon** (History).



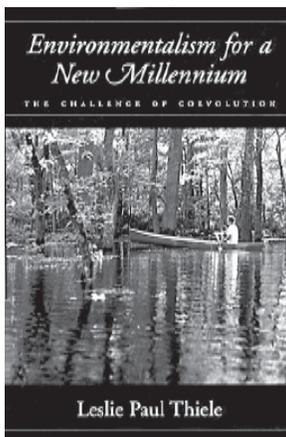
Retiring physics professor **Lennert Peterson** (above left, at reception with wife, **Anne**) was honored during the ceremony along with three other retiring faculty: **Warren Bargad** (English), **Kwan-Yu Chen** (Astronomy) and **Harry Hollien** (Linguistics). Sociology graduate **Samir Siddiqui** (center) and his proud parents at the reception. (above right) CLAS graduates enjoying the reception. (right) President Lombardi congratulated UF's newest alumni.



Environmentalism for a New Millennium: The Challenge of Coevolution
Leslie Paul Thiele (Political Science)
 Oxford University Press

(from book jacket)

Through extensive interviews and a critical study of environmental publications and scholarly research, the author provides an inside look at the environmental movement. His analysis illuminates the social, economic, political and cultural forces that shape the environmental movement today and set its trajectory for the 21st century. Anyone interested in environmentalism will find this book an invaluable guide.



(excerpt)

The coevolutionary perspective is grounded in the belief that, viewed globally and in the long term, the protection of human welfare and the preservation of the natural environment are mutually reinforcing. Coevolutionary biology emerged as a field of study in the 1960s. In its original context, coevolution describes the processes whereby the evolutionary paths of two or more species that maintain a close ecological relationship largely depend on the patterns of their interactions....

To care for the long-term preservation of biodiversity, one first has to be able to care for the short-term preservation of one's economic security and health. Richard Leakey put the point succinctly when he said: "To care about the environment requires at least one square meal a day." Minorities and the poor generally maintain that the basic needs of healthy food, decent housing, and a toxic-free environment rank above the aesthetic and spiritual benefits of wilderness. Until these basic needs are sufficiently satisfied, the latter goods will not be embraced.

The Films of Oshima Nagisa: Images of a Japanese Iconoclast
Maureen Turim (English and Film Studies)
 University of California Press

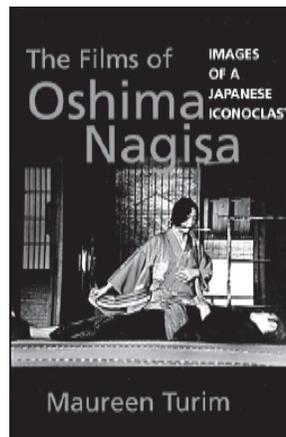
(from book jacket)

Maureen Turim employs psychoanalytic and postmodern theory to explore the films' complex representations of women in Japanese society as well as the films' political engagement with the Japanese student movement, postwar anti-American sentiments, and critiques of Stalinist tendencies of the left. Turim pairs discussion of *Merry Christmas, Mr. Lawrence* with analysis of the psychosexuality of war depicted in Oshima's early adaptation of Oe Kenzaburo's *The Catch*.

(excerpt)

The forces shaping Oshima's entry into the film industry are those of a generalized move toward independent production in the postwar period, with the studios scrambling to co-opt the independents, either by making at least some of their features look like independents, by buying independent companies, or by hiring the independent directors. Cinema as an industry must renew itself as it confronts a crisis... Oshima

and an extraordinary collection of other talented assistant directors were able to seize this opportunity, to market their will to innovation and artistic expression, in some cases joining this with political expression that pushed at the limits of what that industry would allow.



A Companion to Wolfram's Parzival
 Edited by **Will Hasty** (German & Slavic Studies)

(from book jacket)

The original essays in this volume, written by a dozen Wolfram experts working in Europe and the United States, provide a definitive treatment in English of significant aspects of Wolfram's incomparable rendering of the quest for the grail (Wolfram's modes of narrative presentation, his



relationship to his sources, his portrayal of the grail), and of some of the broader social and cultural issues it raises (the theology of the Fall, the status of chivalric self assertion, the characterization of women, the modern reception of *Parzival*).

(excerpt)

Whether seen as sacred or profane, as religious kingdom on earth or as mythic otherworld, the wilderness of *Parzival's* adventures that is organized around the grail kingdom seems to present itself above all as a space of profound psychological and spiritual reflection. In these wilderness spaces, and in the relatively complex figures who occupy them (who for the most part seem a quite a bit more complex than the hero himself), we seem among other things to witness different ways of coming to grips with the damaging effects of chivalry, but in ways that are as demonstrative of a continuation of worldly, courtly/chivalric concerns as of a qualification or criticism of them.

year to retirement or career moves, but the overall number of CLAS faculty is increasing, as it must to meet the needs of a growing student body.

In outside research funding, we came near the \$30 million level, a tribute to faculty skill in gaining nationally competitive awards. These funds are so important in paying for research equipment, supplies, student salaries, etc. They also serve as measures of faculty quality, since the awards are generally decided by peer review, in which selected faculty from other universities sit on review panels that evaluate and decide whose projects are most worthy of support. More and more, CLAS faculty are the benefactors of their decisions.

Private funding was another highlight of the year. CLAS received over \$10 million from alumni, faculty, and friends to fund many critical academic needs, including scholarships, fellowships, professorships, new programs, and facility renovations. Of course, it is the good experience that our alumni have while at UF that influences their willingness to give back to the University later in life. Whether they attended in the 1930s or the 1990s, Gators retain a strong love for this place. And I believe our current graduating class take with them an experience that will reward the fundraising efforts of future deans, department chairs, and faculty.

Lots of other good things have happened this year, but I won't overextend this column in trying to list them all. A very significant addition has been the Keene Faculty Center, housed in Dauer Hall, which has rapidly become a popular site for many types of events. It has proved to be not only beautiful, but very functional, and something that we have needed for a long time. In addition, we are commencing the total renovation of Anderson Hall and Keene-Flint Hall, two of the original UF buildings that had fallen into serious disrepair. By late fall of 2000, these two architectural jewels should be transformed to their former proud state among the most beautiful buildings on campus. This time, with air conditioning.

Wait, there's more. We appointed 60 undergraduate students in the provost's first round of University Scholars Program, along with an equal number of faculty mentors. We are continuing the renovation of Rolfs Hall, and we are also in the process of renovating Williamson Hall for the Department of Geology. New elevators were installed in Dauer and Rolfs Hall. And, and, and.....

Thanks again to all who helped make this year such a success.

Will Harrison,
Dean
[harrison@chem.ufl.edu]

A Note From the Chair

Faculty and students in the Department of Zoology study a diverse array of biological problems, everything from the gene sequences that identify human ancestry to the mating behavior of horseshoe crabs to the development of larval starfish. We work from the molecular or cellular level to the level of the individual, community or landscape to identify the factors that influence individual behavior, community structure or ecosystem dynamics. Our colleagues in the Florida Museum of Natural History and joint faculty in Zoology add an important dimension to our program through their emphasis on paleontology and the historical influence of humans on species and communities.

We cover tropical and temperate, marine, freshwater and terrestrial habitats; we work in all parts of the world including Africa, Central and South America, the Caribbean, the South Seas and Florida. We study a wonderful array of life from alligators and turtles to fish, birds, primates, fruitflies and spiders. Training in the biological sciences occurs in many colleges and departments at UF (e.g., Medical School and IFAS), but it is our integrative view of the life sciences, using an evolutionary and ecological approach, that makes Zoology special. Most of our undergraduate majors are pre-professional students aspiring to careers in medicine, environmental science, and biology research and teaching. Introductory Biology is taught in collaboration with the Department of Botany through the Biological Sciences Program. This Program provides hands-on, laboratory experiences in modern biology for 4,700 life science students annually (and for another 600 non-majors). Our upper-division Zoology courses emphasize investigative science through laboratory and Web-based research experiences. Many of our majors go on to conduct extended research projects with UF faculty and graduate students.

Quality graduate and undergraduate teaching in the biological sciences requires modern facilities. This year we are adding a Computer Teaching Laboratory so that all of our undergraduate courses can benefit from computer-assisted learning. For example, our genetics courses train students to use genetic databases available on the Web to discover the hereditary basis of disease, and our ecology courses train students in statistics and data analysis. Thanks to ICBR (Interdisciplinary Center for Biotechnology Research) we added a Genetic Analysis Laboratory this year that provides graduate students with an opportunity to learn modern molecular techniques that are as crucial to research in evolution and ecology as they are to research in physiology and development. But the most exciting recent changes to our program have been the addition of outstanding faculty in quantitative genetics and theoretical ecology, two areas that are new to our Department. We are delighted with the added depth that these individuals bring to our program and with the possibilities they afford for new collaborations. The Department is also working to bring top-flight molecular biologists to CLAS through the Provost's genetics initiative.

Our students will be asked to solve the ever-expanding problems of agriculture (e.g., pest resistance), medicine (e.g., new diseases and drug resistance) and the environment (e.g., maintenance of biological diversity and habitat conservation). Rapidly expanding technologies allow us to address such problems in ways we would not have imagined possible even 10 years ago. The Zoology program must provide students with the foundation knowledge, theory and tools (integrative, ecological, evolutionary) they will need to address these challenges of the future. The faculty particularly enjoy sharing our fascination for the biological complexity and diversity which lies at the heart of many of these problems. 🐾



Jane Brockmann, Chair
Department of Zoology