

# SOUTHEASTERN BIOLOGY



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## ONLY CALL FOR PAPERS FOR THE 65<sup>th</sup> MEETING

ASB

ASB

ABSTRACT SUBMISSION – SEE PAGE 258

ASB



Robert Haynes addresses the banquet audience as  
Past President of the Association

ASB

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### **PURPOSE**

The purpose of this association shall be to promote the advancement of biology as a science by encouraging research, the imparting of knowledge, the application of knowledge to the solution of biological problems, and the preservation of biological resources. The ASB has representation in Section G Committee of the AAAS. Varying types of membership are available to individuals and institutions. See inside back cover.

### **Time and Place of Future Meetings**

2004 April 14-17 Co-hosted by University of Memphis, Rhodes College, and Christian Brothers University, Memphis, Tenn.

2005 April 13-16 Hosted by the University of North Alabama, Florence, Alabama.

## A MESSAGE FROM THE PRESIDENT

ANDREW N. ASH

Thinking about it, I am surprised to find that I have been a professional biologist since 1977. I'm not asking you to count, but amazingly, it comes to 26 years. During that time, I have worked at three different academic institutions and have served on many committees and panels of various types. A biologist's life, particularly at academic institutions, is characterized by change. Upon reflection, there are few constants in my professional life, but one of those constants has been ASB. Some of my very best experiences as a biologist, and some of my very best friends are due to my affiliation with ASB. My life would not be the same without them. So it is with pride and thanks that I write this message.

ASB exists primarily to plan and host an annual meeting. This goal is achieved by ASB's function as an umbrella organization for affiliate societies that meet in conjunction with us each year. While this might seem a fairly restricted aim for an organization, it is both a very important one to biologists in the southeast, and a very difficult and time-consuming one to accomplish. A well-planned and executed annual meeting is a pleasure to attend, but we have all been irritated or inconvenienced when things occasionally don't come off as planned or are not up to professional standards. An important thing for all of us to remember is that individuals are volunteering their services and the facilities of their institutions on behalf of ASB in order to host these meetings. Having been associated with the executive committee of ASB for quite a few years, and having come to appreciate the level of planning and coordination necessary to make an annual meeting proceed with (apparent) flawless ease, I am now struck more by the fact that so little does go wrong as opposed to being irritated when they do.

Which gets me to my point. Many of us have or will make ASB one of the annual focal points of our careers. Putting on an ASB meeting is a complicated undertaking that requires well over two years of planning and preparation for any one meeting. So I want to propose to every member that you participate in ASB fully. That is, don't just come to the annual meetings, but serve the organization in some way as your situation allows. There are many ways to serve: help plan or organize a meeting at your institution, help with the recruitment of patrons or exhibitors, chair a paper session, plan a symposium, lead a field trip, volunteer for committee work, stand for election to the executive committee or to an ASB office. The list of possibilities is long.

Basically, get involved. Volunteer organizations depend on volunteers. The image ASB presents to governments and the public should be a multiple and complex reflection of all its members, not just a few. ASB has been the benefactor of important contributions from many fine people, but the organization will only get stronger as the support base grows. Personally, I have found an increased role in ASB leadership to be extremely rewarding and I think anyone who invests the effort will feel the same way. This September, the executive committee of ASB and local arrangements leaders from the University of

Memphis and from the University of North Alabama will meet for a weekend in order to fine tune planning of the 2004 annual meeting and to continue planning for future meetings. Remember these efforts when you come to Memphis next year. I hope to see all of you in April, and I hope each of you will make it a goal to participate in the organization which has brought so much enlightenment, fellowship and enjoyment to so many for so long.



Andrew Ash (right) receives the gavel from Kenneth Shull.

## ASSOCIATION OF SOUTHEASTERN BIOLOGISTS

### 64<sup>th</sup> ANNUAL BUSINESS MEETING FRIDAY, 11 APRIL 2003 CRYSTAL CITY HYATT REGENCY HOTEL ARLINGTON, VIRGINIA

**Call-to-Order**—President Kenneth Shull called the 64<sup>th</sup> Annual Business Meeting of the Association of Southeastern Biologists to order at 11:30 AM with 70 members in attendance.

Ken Shull announced Lafayette Frederick's 80<sup>th</sup> birthday and reminded everyone of the 50<sup>th</sup> anniversary of the discovery of DNA coming up April 25<sup>th</sup>.

Ken pointed out two typos in the 2003 Annual Business Meeting minutes as distributed and asked, if there were no objections, that the minutes of the 2002 business meeting be approved as amended. Hearing no objections, Ken declared the minutes approved as amended.

**Election of Officers**—Ken announced the following slate of officer candidates presented by the Nominations Committee:

President-Elect—Fran Schwartz, Claudia Jolls, and Beverly Collins

Vice President—Kim Marie Tolson and George Cline

Secretary—Terry Richardson

Executive Committee—Jerry Ritchie, Jennifer Davis, John Aho, and Debbie Moore

Ken then asked for nominations from the floor and hearing none called for the nominations to be closed and the slate accepted. It was so-called and approved. Ballots were collected by tellers and removed for tallying.

**Local Arrangements 2003, Arlington, VA**—Co-chair Lafayette Frederick gave a meeting report. Lafayette indicated 544 paid registrants were in attendance at the meeting and 225 attended the Thursday evening social. Lafayette indicated these were all the data available at present and a complete report would be forthcoming.

**President's Report**—Ken Shull gave the report. He introduced an amendment to the ASB Bylaws presented by the Executive Committee. The amendment was to change Article VII, Section 1, from

“H. The Meritorious Teaching Award Committee may each year select *a member of the Association to receive the award for meritorious teaching at the college level.* [emphasis added] The committee shall consist of three members appointed for terms of 3 years, with a member appointed annually and serving as Chair in the third year.”

to read,

“H. The Meritorious Teaching Award Committee may each year select *for the award a member of the Association who has taught biology for at least ten years in any college or university represented in the Association.* [emphasis added] The committee shall consist of three members appointed for terms of 3 years, with a member appointed annually and serving as Chair in the third year.”

Ken opened the floor for discussion and hearing none asked the amendment be approved. The amendment was approved unanimously.

**Secretary's Report**—Terry Richardson announced news received of deceased members over the past year and asked if there were any additions. The only deceased member known was Dekalb Russell. Terry called for a moment of silence for Dr. Russell. Terry also asked that anyone having information and/or photographs of Dr. Russell suitable for an obituary please contact Jim Caponetti, Print Editor.

Terry read the following names as those having applied for emeritus status with ASB: Charles Boehms, John Just, Joe Ann Lever, Donald Shure, and Don Windler.

**Motion 1:** Ken called for a motion that these members be awarded emeritus status with ASB. Joe Winsted moved and Andy Ash seconded. The motion passed unanimously.

**Treasurer's Report**—Tim Atkinson presented the treasurer's report and the report from the membership officer. Tim indicated the current balance was \$94,383.00 down \$2,330.00 from the previous year. He mentioned the decrease was mostly due to receiving invoice and paying for last year's issue three of the Bulletin this year. Tim presented the proposed budget for 2004 and asked for any questions or discussion. There were some questions from the floor regarding publication costs.

**Motion 2:** Ken called for a motion to accept the proposed budget for 2004. Robert Haynes moved and Kim Marie Tolson seconded. The budget passed.

Tim presented a report of the Enrichment Fund status. He indicated we incurred no losses over the past year and earned modest interest. The balance stands at \$38,620 up \$820 from contributions and \$1,034.00 in interest. Tim indicated the Enrichment Fund was now in a separate account from the remaining ASB funds.

In the Membership Officer Report, Tim indicated membership was currently up from this same time last year from 922 members to 1195. He pointed out this did not include the 100-200 members gained during registration at this meeting. He predicted current numbers of between 1300 and 1400 after the meeting.

**Print Editor's Report**—Jim Caponetti gave the print editor's report. Jim mentioned the approved change in the membership year had now been

published in the Bulletin and reminded everyone the membership year now ran from April to April (meeting to meeting). Jim also indicated the Bulletin rate had been increased from \$5 per issue to \$7.

**Resolutions Committee Report**—Chair Robert Haynes gave the report. Robert read a resolution of appreciation to Howard University and Bowie State University and the Local Arrangements Committee as a motion from the committee.

**Resolution 1:** Ken Shull asked that the resolution of appreciation to Howard University and Bowie State University and the Local Arrangements Committee be approved. The resolution was unanimously approved.

**Old Business**—Ken asked that members talk to sales representatives as they make visits and encourage them to show at the annual meeting of ASB. John Herr was recognized from the chair. John pointed out that the ASB Archives had been successfully moved to the University of Georgia and described the location of the archives in the library.

**New Business**—No new business was presented.

**Election of Officers**—Ken announced that there was need for a run-off between Claudia Jolls and Beverly Collins for the office of president-elect

**Election Results:**

[Note from the Secretary: Results of the election of officers are presented herein as a matter of record. Election results are not announced at the Annual Business Meeting, but rather are held for announcement at the Annual ASB Banquet.]

Claudia Jolls, President-Elect  
Kim Marie Tolson, Vice President  
Terry Richardson, Secretary  
Debbie Moore, Executive Committee Member-at-Large  
Jerry Ritchie, Executive Committee Member-at-Large

**Adjournment:** The 64<sup>th</sup> Annual Business Meeting of the Association of Southeastern Biologists adjourned at 12:00 noon.

Respectfully Submitted,

Terry D. Richardson  
Secretary

**EVENTS OF THE 2003 ANNUAL MEETING IN ARLINGTON, VIRGINIA  
CO-HOSTED BY HOWARD UNIVERSITY AND BOWIE STATE UNIVERSITY**

**ASB MERITORIOUS TEACHING AWARD  
UNIVERSITY PROFESSOR HONORED**

**J. KENNETH SHULL**

The 2003 winner of the ASB Meritorious Teaching Award was Dr. J. Kenneth Shull, Jr. Dr. Shull grew up in Alabama and obtained his Bachelor's and Master's degrees from the University of Alabama, Tuscaloosa. He then earned his Doctorate degree at Florida State University in 1973. From 1973 to 1984 he taught at Loyola University in New Orleans, where he rose to the rank of Associate Professor of Biology and was Department Chair. In 1984 he moved to Appalachian State University in Boone, North Carolina, where he is now Professor of Biology. His research in cytogenetics has involved such diverse organisms as salamanders, lilies, and fruit flies. His skills as a teacher and advisor are legendary. In addition, he has been involved with the Association of Southeastern Biologists since 1970, attending nearly every meeting since then. Dr. Shull has been a member of and has chaired most of ASB's committees, and he has served in nearly all of ASB's elected offices, most recently as President.

Students and faculty colleagues alike were enthusiastic in their support of Dr. Shull. Words like approachability, compassion, tact, intelligence, vision, and love were used by one former student to describe his gifts. Other words, like enthusiasm, intelligence, excitement, dedication, commitment, and concern, appeared again and again in Dr. Shull's letters of support. Students recount being invited to his home for a real home-cooked meal and his habit of staying in touch with former students long after they graduated.

Dr. Shull is known for setting high standards for his students, one of whom said, "His reputation as one of the premiere instructors in the department held true, along with his other creed: that if you were unfamiliar with the class material, you would suffer very quickly academically. Unfortunately, I had to learn this several times before the lesson cemented." However, the picture also emerges of a caring and supportive teacher. The same student continued, "What always impressed me is his genuine concern for the well being of his students, no matter what their background. If you were not doing well, he wanted to know why and offered any help he could. If you were becoming lackadaisical in your studies, he would inquire personally. If you just needed to talk, then he was always available."

It is also clear that Dr. Shull's influence has extended far beyond the classroom. One former student recalled how a visit to his office to inquire about a question on a genetics test blossomed into a series of meetings that led to profound and positive changes in the student's self-esteem and, eventually, to a career in biology. Another former student said, "Without his believing in my potential and capability for doing research, I would not have had the opportunities that have led me to where I am today."

Dr. Shull's impact on students is long lasting. One former student, now Associate Professor of Genetics at a major research university, wrote, "This is a large university and there are many demands on my time. When tempted to restrict the amount of time I spend with students, I try to think back to how important a role he had in helping me find my career path, and I try to hold up my end, and help the next generation." Dr. Shull has also served as a mentor for his faculty colleagues, one of whom said, "I feel very fortunate to have him as a colleague. He has truly been a mentor to me. He took the time when I first arrived to show me the ropes and help me get my teaching up and running."

Two supporting statements summarize the reasons why Dr. Shull was selected as this year's recipient of the ASB Meritorious Teaching Award. The first is from a colleague, who said, "He is an exceptional teacher. He was a role model for me when I was young and inexperienced, and he remains so still. I suspect that he is dedicated to this profession because he takes seriously the remark by H. G. Wells that 'civilization is a race between education and catastrophe.' He cares deeply about his students. He cares not only that they learn, but that they learn to love learning." The second statement is from a former student, who said, "I can think of no other person more deserving of this award not only because of his profound dedication to teaching but his devotion to everything he does and everyone he touches in his life. Again, thank you for this opportunity to honor him, and his love of teaching."



Thomas Wentworth (left) presents the 2003 Meritorious Teaching Award to J. Kenneth Shull, Professor of Biology at Appalachian State University.

**ASB ENRICHMENT FUND AWARD  
HIGH SCHOOL TEACHER HONORED**

**Demby Banbury**

The ASB recognized the 2002 Outstanding Biology Teacher (as determined by NABT) from the state of Virginia at the 64<sup>th</sup> Annual Meeting in Arlington, Virginia. Mrs. Demby Banbury is a biology teacher at McLean High School in McLean, Virginia. She was introduced and presented with \$500 from the Enrichment Fund account prior to the plenary speaker on Wednesday night.



**2003 RESEARCH AWARD RECIPIENTS**

**ASB SENIOR RESEARCH AWARD**

The ASB Senior Research Award was presented by Dwayne Wise (award committee chair) to **Sisir Dutta** of the Department of Biology, Howard University, Washington, DC, for his manuscript entitled "Bioremediation of soils containing dinitrotoluene (DNT) using genetically modified *Sinorhizobium meliloti*." His paper presentation at the annual meeting is entitled "Enhanced bioremediation of 2,4-dinitrotoluene in soil by a genetically modified *Sinorhizobium meliloti*" co-authored with **Gail P. Hollowell**, **Fawzy M. Hashem**, and **L. David Kuykendall**, *SE Biology Abstr.* 197, 50(2).

**ASB STUDENT RESEARCH AWARD**

The ASB Student Research Award sponsored by the Martin Microscope Company, Easley, SC, was presented by Raymond L. Petersen (award committee chair) to **Shercoda G. Smaw**, Department of Biology, Howard University, Washington, DC, for her paper entitled "An in vitro assessment of simulated rain and pH on the urban-adapted moss *Bryum capillare*," co-authored with **Raymond L. Petersen**, *SE Biology Abstr.* 129, 50(2).

The committee also singled out the following paper for honorable mention:

**Stephanie B. Jeffries**, Department of Forestry, North Carolina State University, Raleigh, NC, for her paper entitled "How do short rotations and intensive management affect plant communities in a loblolly pine (*Pinus taeda*) plantation?" co-authored with **Thomas R. Wentworth** and **H. Lee Allen**, *SE Biology Abstr.* 188, 50(2).

**ASB STUDENT RESEARCH AWARD IN AQUATIC BIOLOGY**

The ASB Student Research Award in Aquatic Biology was presented by Raymond L. Petersen (award committee chair) to **Deborah A. Hutchinson**, Department of Biological Sciences, Old Dominion University, Norfolk, VA, for her paper entitled "Vasculature of the parotoid glands of *Bufo alvarius*, *B. marinus*, *B.*

*terrestris*, and *B. valliceps* (Amphibia: Anura)" co-authored with **Alan H. Savitzky**, *SE Biology Abstr.* 171, 50(2).



### EUGENE P. ODUM AWARD

The Eugene P. Odum Award sponsored by the Southeastern Chapter of the Ecological Society of America was presented by Michael E. Held (award committee chair) to **Stephanie B. Jefferies**, Department of Forestry, North Carolina State University, Raleigh, NC, for her paper entitled "How do short rotations and intensive management affect plant communities in a loblolly pine (*Pinus taeda*) plantation?" co-authored with **Thomas R. Wentworth** and **H. Lee Allen**, *SE Biology Abstr.* 188, 50(2).



Stephanie B. Jefferies receives the Eugene P. Odum Award from award committee chairperson Michael Held.



### THE NORTH CAROLINA BOTANICAL GARDEN AWARD

The North Carolina Botanical Garden Award sponsored by the NCBG was presented by Johnny Randall (award committee chair) to **Jan D. Sellars**,

Department of Biology, East Carolina University, Greenville, NC, for his paper entitled "Success of seabeach amaranth (*Amaranthus pumilus* Raf.) using habitat selection based on light detection and ranging (LIDAR) data" co-authored with **Claudia L. Jolls** and **Cass A. Wigent**, *SE Biology* Abstr. 189, 50(2).



## AWARDS FROM THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

### Robert H. Gibbs, Jr., Memorial Award

Presented for excellence in systematic ichthyology. In July 2002 at the ASIH annual meeting in Kansas City, Missouri, the award for 2002 was presented to **Dr. Joseph S. Nelson**, Department of Biological Sciences, University of Alberta, Edmonton, for his outstanding contributions to the systematics of sticklebacks and psychrolutids and publication of three editions of his invaluable book *Fishes of the World*.

### Henry S. Fitch Award

Presented for excellence in herpetology. The award for 2002 was presented to **Dr. Robert F. Inger**.

### Raney Fund Awards

Awards of \$1,000 were made to each of the following young ichthyologists in 2002:

**Martha Burford**  
**Mark Dugo**

**Anna George**  
**Andrew Kinziger**

**Ashley Siefert**

### Gaige Fund Awards

Awards of \$500 were made to each of the following young herpetologists in 2002:

**Lynn M. Almli**  
**Ronald M. Bonett**  
**David Chapple**  
**Alison M. Hamilton**

**Robyn Konvalinka**  
**Kenneth H. Kozak**  
**Day Ligon**

**Melissa A. Pilgrim**  
**Chelsa Ward**  
**Heather Waye**

### Stoye Awards

Awards for best oral presentations were made to each of the following students in 2002:

**Nancy I. Holcroft** (ICH)  
**Rebecca Thomas** (GD&M)  
**Jill P. Zamzow** (P&PE)

**Sarah A. Smith** (HERP)  
**Mia S. Adreani** (E&E)  
**Oliver F. Berry** (CONSERV)

## Storer Awards

Awards for best poster presentations were made to each of the following students in 2002.

**Jason A. Moretz** (Ichthyology)

**Rith S. Mehta** (Herpetology)



## SOUTHEASTERN DIVISION OF AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS AWARD

The Southeastern Division of ASIH Award was presented by the society's Division President Jeffrey Camper for Ichthyology to **Jeffrey W. Simmons**, U. S. Geological Survey and Tennessee Cooperative Fishery Research Unit, Tennessee Technological University, Cookeville, TN, for his paper entitled "Reproductive ecology of the endangered bluemask darter, *Etheostama* (Doration) sp." co-authored with **James B. Layzer**, *SE Biology* Abstr. 168, 50(2); and for Herpetology to **Deborah A. Hutchinson**, Department of Biological Sciences, Old Dominion University, Norfolk, VA, for her paper entitled "Vasculature of the parotoid glands of *Bufo alvarius*, *B. marinus*, *B. terrestris*, and *B. valliceps* (Amphibia: Anura)" co-authored with **Alan H. Savitzky**, *SE Biology* Abstr. 171, 50(2).

President Camper was also pleased to report that the following two students presenting a paper at the annual meeting were awarded a travel grant:

**Deborah A. Hutchinson**, Department of Biological Sciences, Old Dominion University, Norfolk, VA.

**Kristine L. Grayson**, Department of Biology, Davidson College, Davidson, NC.



## SOUTHERN APPALACHIAN BOTANICAL SOCIETY AWARDS

Zach Murrell, President of SABS, presented awards in two categories at the Friday morning breakfast meeting, and announced the names of the awardees at the Friday night banquet.

### Earl Core Student Research Awards

Dr. Earl Core was a major force in the founding of the Southern Appalachian Botanical Club in 1936. The annual Core Student Award was established by the Society to provide financial assistance in support of student research projects in plant taxonomy, systematics, and ecology.

Four awards of \$250 each were presented:

**Lorelei J. Hartman** (Longwood University)—A comparison of clearcut and shelterwood harvesting effects on understory plant species in central Virginia piedmont forests.

**Joey Shaw** (University of Tennessee)—Morphological analysis of *Prunus* sect. *Prunocerasus*.

**Olin Scott Taylor** (Appalachian State University)—Biosystematic investigations of the *Lindera benzoin* complex in North America.

**Lisa Williams** (George Mason University)—Floristic survey of the eastern Goose Creek watershed, Loudoun County, Virginia.

### Richard and Minnie Windler Award

The Richard and Minnie Windler Award was established in 1990 at the annual meeting of the SABS by Dr. Donald R. Windler of Towson University as a memorial to his parents. The award is presented annually to the author or authors of the best systematic botany paper published in *Castanea* during the previous year. The eligible papers may fall into the broad area of plant systematics, including floristic, experimental, revisionary, and nomenclatural studies.

The recipients of the award this year are:

**James A. Schrader** and **William R. Graves**, for their paper "Infraspecific Systematics of *Alnus maritime* (Betulaceae) from Three Widely Disjunct Provinces," which appeared in *Castanea* 67: 380-401.



## BETA BETA BETA BIOLOGICAL SOCIETY SOUTHEASTERN REGION OUTSTANDING PAPER AND POSTER AWARDS

### District I Paper – Brooks Award Winners

- 1<sup>st</sup> Place **Paóla Lopez-Duarte**, Florida Institute of Technology, Sigma Psi. "Circatidal swimming behavior of brachyuran crab zoea larvae: Implications for ebb-tide transport"
- 2<sup>nd</sup> Place **Valerie Le Bleu**, Florida Institute of Technology, Sigma Psi. "Cell culture in a rotating bioreactor: Impact of gravity on the cell cycle of mouse leukemic lymphocytes"
- 3<sup>rd</sup> Place **Brandi Mueller**, University of Tampa, Sigma Nu. "Health quality of *Halodule wrightii* seagrass growing near marinas"
- HM **Neeta N. Kirpalani**, Wake Forest University, Beta Rho. "Phosphorylation signaling and the regulation of auxin transport in *Arabidopsis thaliana* roots and hypocotyls"

**District II Paper – Brooks Award Winners**

- 1<sup>st</sup> Place **Mary Elizabeth Hill**, Columbus State University, Mu Omicron. “The effects of aposematic coloration on the food preference of *Aphelocoma ceorulescens*, The Florida scrub jay”
- 2<sup>nd</sup> Place **JoAnne Brown**, Columbus State University, Mu Omicron. “The differential effects of nickel on 4 strains of nematode, *Caenorhabditis elegans*”
- 3<sup>rd</sup> Place **Phyllis L. Spurr**, Northern Kentucky University, Mu Iota. “Lichens as bioindicators of future health within a mature hardwood forest in Grant County, Kentucky”
- HM **Michelle A. Fry**, Northern Kentucky University, Mu Iota. “Investigating the link between a dinoflagellate and marine head and lateral line erosion of brown sailfin tangs, *Zebrasoma scopes*”

**District I Poster – Johnson Award Winners**

- 1<sup>st</sup> Place **Jonathon D. Marchal**, Brevard College, Rho Pi. “A comparison of two order-level biotic indices for southern Appalachian streams”
- 2<sup>nd</sup> Place **Amanda C. Wason**, Brevard College, Rho Pi. “Sex differences in the behavioral ecology of mantled howling monkeys (*Allouatta palliate*)”
- 3<sup>rd</sup> Place **Randa M. Perkins**, Florida State University, Sigma Tau. ““Super-smeller” mice and altered olfactory connections in Kv1.3-null mice”

**District II Poster – Johnson Award Winner**

- 1<sup>st</sup> Place **Jennifer K. Quammen**, Northern Kentucky University, Mu Iota. “Do tadpoles have a stomach? Evidence of enzymatic activity in the wood frog (*Rana sylvatica*)”

### THE PEMBROKE GROUP AT ARLINGTON, VIRGINIA

Pictured are students and faculty of the University of North Carolina, Pembroke, Department of Biology, who attended the 64<sup>th</sup> Annual Meeting of the Association of Southeastern Biologists in Arlington, Virginia.

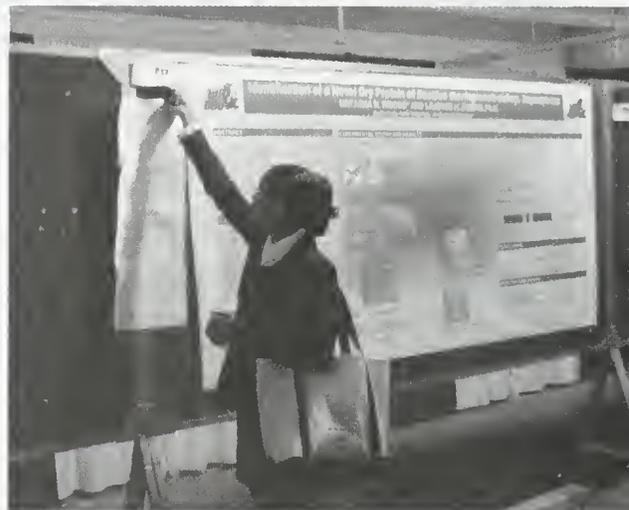
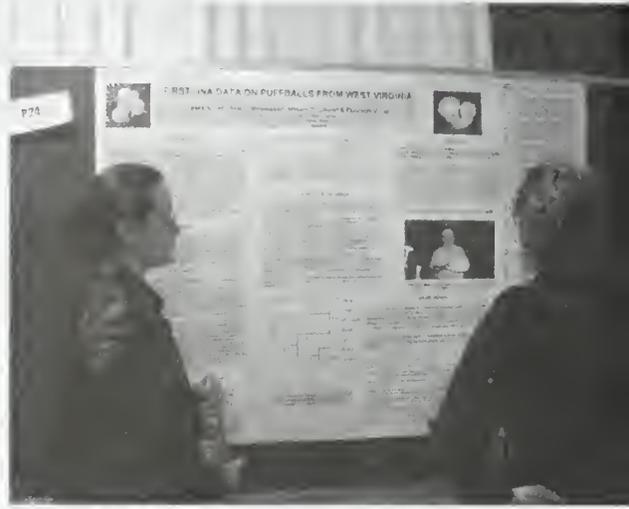


Seated, from left to right: Adria Pontious, Rebecca Rice, Bonnie Kelley (faculty), Laura Bowers, Lisa Kelly (faculty). Standing, from left to right: Candy Jacobs, Bruce Ezell (faculty), Rebecca Blake, Susan Severson, Kathleen Long, Rebecca Wilson, Dena Felty, Tracy Armstrong, Andrew Ash (faculty), Kathy Frye, Allen Derks, Vernon Garner, and Leon Jernigan (faculty).

# THURSDAY EVENING AT THE BIRCHMERE



## POSTER PRESENTATIONS AT THE ANNUAL MEETING IN THE HYATT REGENCY CRYSTAL CITY



**RESOLUTION OF APPRECIATION  
TO HOWARD UNIVERSITY AND  
BOWIE STATE UNIVERSITY**

**Whereas** the Howard University and Bowie State University did agree to make all local arrangements for the Association of Southeastern Biologists to hold its annual meeting on April 9-12 in Arlington, VA, and

**Whereas** Local Arrangements Co-Chairs Lafayette Frederick and Geraldine Twitty and Program Chair Elaine Davis did an admirable job of orchestrating the events and organizing the paper and poster sessions, and

**Whereas**

William Gordon organized audiovisuals,  
Geraldine Twitty coordinated commercial exhibits and corporate sponsorships,  
Raymond Petersen planned field trips,  
Elaine Davis organized posters,  
Franklin Ampy handled meeting statistics,  
Geraldine Twitty made social arrangements,  
Lafayette Frederick coordinated with Beta Beta Beta,  
Geraldine Twitty coordinated symposia and workshops,  
William Eckberg managed the web page, and

**Whereas** the citizens of Arlington, VA, and the administrators of Howard University and Bowie State University cooperated to welcome ASB to the city of Arlington, and

**Whereas** the students of Howard University and Bowie State University volunteered to assist with local arrangements,

**Therefore**, let it hereby be resolved that the members and officers of the Association of Southeastern Biologists give their sincere thanks and appreciation to all involved in making this the excellent and memorable ASB meeting that resulted from the cumulative efforts of these individuals and organizations.

April 11, 2003

## OMITTED ABSTRACTS

These abstracts were either received too late for or were accidentally omitted from the April, 2003, abstract issue listing.

HERR, JARED, ADAM CASSIS, AND DARWIN JORGENSEN. Biology Department, Roanoke College, Salem, VA—Respiratory pump effect on the gill circulation in the American lobster, *Homarus americanus*.

The American lobster is a migratory crustacean arthropod that moves about underwater principally by walking. We are interested in characterizing respiratory and cardiovascular systems support of underwater movement in these animals. Lobsters have two gill sets each occupying a laterally-located, enclosed space, the branchial chamber (BC). Each BC has a muscularly-driven pump, the scaphognathite (scaph), which generates a cyclic, suction pressure in the BC to move water unidirectionally past its gill set and through an exhalant opening located lateral to the mouth. We wished to determine if the action of the scaph (and the suction pressure it generates) has an effect on the gill circulation. We monitored hydrostatic pressure (with strain gauge transducers connected to fluid-filled catheters) in each BC concurrently with pressure in the pericardial space (PS) and the infrabranchial sinus (IBS) bilaterally (allowing for the calculation of hydrostatic pressure drop across the gill circulation) in lobsters as they walked at a steady rate on a submerged treadmill. We found a 2-3-fold ventilation rate increase (associated with walking) driven by greater scaph activity resulting in a 5-fold decrease in BC pressure. The pressure drop across the gill circulation decreased by about 5-fold during the period of increased ventilatory activity indicating a possible passive dilatory effect of BC pressure on the gill circulation. Functional mismatch of the two respiratory sets was also noted.

SWAIM, PAMELA A. AND MIJITABA HAMISSOU. Jacksonville State University—Molecular Analyses of Plant Defense Factors (PDF) of *Arabidopsis thaliana* in response to simulated insect feeding.

Throughout their life cycle, plants must respond to challenges from the environment and to changes in the seasons. Like any organism, plants are constantly subjected to attack by a wide variety of predators such as insects, bacteria, fungi, and viruses. Plants respond to predatory attacks by lignifying their cell wall, by synthesizing, or by inducing a programmed cell death. Researchers have recently pointed out the existence of a sophisticated immune system in plants that triggers signaling that activates a defense gene expression, essential for the plant's survival. The objective of this study is to understand some aspects of plants responses to insect feeding. Two strains of *Arabidopsis* were raised in pots containing a mixture of sand and vermiculite in a growth chamber at 25°C, 16 hours day, 8 hours dark for four weeks before subjecting them to leaf puncturing and micromolar application of Jasmonic acid or a mixture of middle lamella dissolving enzymes pectinase and cellulase to mimic sucking insects. Leaf samples were taken for native enzymes extraction. Plant defense factors (PDF) were studied in the cell extracts by assaying for protease inhibitors and peroxidase activities, and by western blot analysis. Preliminary data indicated that plants respond to mechanical wounding and pectinase treatment by increasing the concentration of total cytoplasmic proteins.

WOODS, NATASHA AND LALOYCE H. DEBRO. Jacksonville State University—Identification of a novel Cry protein of *Bacillus thuringiensis* subsp. *Irapuatensis*.

*Bacillus thuringiensis* is a spore forming bacterium that forms a secondary structure, a Cry protein, with biopesticidal activity. Many Cry proteins are used commercially to control insects and worms of economic and agricultural importance. However, as toxins are used over and over, organisms are showing selective resistance. To overcome resistance, new toxins must be introduced into the organism's environment. *B. thuringiensis* subsp. *Irapuatensis* (LBIT-113) is a new isolate recovered from *Anopheles* mosquito larvae. The objective of this study was to determine the pesticidal potential of its Cry protein based on sequence analysis. The Cry protein has a unique morphology and an unknown toxic spectrum. It is a flat, square structure that is visibly attached to the spore and surrounded by the exosporium. Its main protein component is a polypeptide of 88kDa. Partial N-terminal and internal amino acid sequences were determined and back translated into corresponding DNA sequences. Degenerate primers were designed and used in PCR. A 950bp PCR product homologous to template DNA was cloned and sequenced. An analysis of 950 bp of sequence confirms the presence of both the amino terminal and the internal amino acids used in designing the primers. However, a BLAST-S analysis of the sequence reveals no homology to any Cry proteins reported in GenBank. We conclude that the Cry protein of *B. thuringiensis* subsp. *Irapuatensis* is novel. The National Science Foundation (RUI and REU) and a Faculty Research Grant from Jacksonville State University funded this project.



ASB Executive Committee at the annual meeting. Seated, from left to right: Claudia Jolls, Andrew Ash, Kim Marie Tolson, Kenneth Shull. Standing, from left to right: Rebecca Cook, Debbie Moore, Tim Atkinson, Terry Richardson, John Herr, Michael Dennis, Thomas Wentworth, James Caponetti.

The *Southeastern Naturalist* . . .

- ◆ A quarterly peer-reviewed and edited interdisciplinary scientific journal with a regional focus on the southeastern United States (ISSN #1528-7092).
- ◆ Featuring research articles, notes, and research summaries on terrestrial, fresh-water, and marine organisms, and their habitats.
- ◆ Focusing on field ecology, biology, behavior, biogeography, taxonomy, evolution, anatomy, physiology, geology, and related fields. Manuscripts on genetics, molecular biology, archaeology, anthropology, etc., are welcome, especially if they provide natural history insights that are of interest to field scientists. Symposium proceedings are occasionally published.
- ◆ Indexed in Biological Abstracts (BIOSIS), BIOSIS Previews, CAB Abstracts, Cambridge Scientific Abstracts, EBSCO-host, Environmental Knowledge-base (formerly Environmental Periodicals Bibliography), FISHLIT (Fish and Fisheries Worldwide; Aquatic Biology, Aquaculture, and Fisheries Resources), Wildlife Review Abstracts, and Zoological Record (BIOSIS UK). Arrangements for indexing in Elsevier BIOBASE (Current Awareness in Biological Sciences), and ISI Services (Science Citation Index-Expanded, ISI Alerting Service, and Current Contents/Agriculture, Biology, and Environmental Sciences) are pending.
- ◆ A sister journal of the *Northeastern Naturalist* (ISSN #1092-6194), published since 1997. Both journals are identical in focus, format, quality, and features. The journals together serve as a matched-pair of regional journals that provide an integrated publishing and research resource for the eastern part of North America.
- ◆ Printed by Allen Press, printer of many journals in the biological and environmental sciences, especially those whose parent organization is a member of the American Institute of Biological Sciences (AIBS).
- ◆ Available online in full-text version in the BioOne database ([www.bioone.org](http://www.bioone.org), a collaborative effort of Allen Press, AIBS, and other organizations) and the Proquest Information and Learning databases ([www.il.proquest.com](http://www.il.proquest.com)).

# Southeastern Naturalist

Volume 2

2003

Number 1



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# Southeastern Naturalist

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### **SOUTHEASTERN NATURALIST REPORT**

The *Southeastern Naturalist* is now in its second year. The publishing schedule of the journal remains on time. Over 170 manuscripts have been accepted for review since the journal was launched. The page count of the journal continues to increase. The first issue had 96 pages. The current issue has 160 pages! The journal peer review process continues to work well, given that it relies heavily on a well-informed Board whose members make suggestions of potential guest editors for each manuscript. The focus of the journal is mostly on zoology, though key articles in botany have been published or are in review. Subject coverage in terms of terrestrial, freshwater, and marine natural history sciences is reasonably balanced. With 725 subscribers towards the end of 2002 and voluntary contributions towards publication costs from institutions of authors, the journal continues to approach financial self-sustainability. About 20 percent of colleges and universities in the Southeast are subscribing, something which is not surprising given the many challenges facing libraries nowadays. The number continues to increase at a modest rate, in part because we continue to encourage the view among librarians, institutions, and authors, that the journal over time will serve as an important natural history science information resource for the region and that it is thus an essential library journal and an essential personal reference resource. Overall, the journal is doing well and no changes in journal policy are expected in the near future. As always, suggestions regarding the journal are very welcomed. ASB members represent about 25 percent of the subscription base of the journal. Thanks to the thoughtful coordination with Tim Atkinson, we have worked out a good administrative system for confirming ASB membership whenever someone requests the 20 percent ASB member's discount. Requests for ASB membership information from non-members who are subscribers are directed to Tim Atkinson. The *Southeastern Naturalist* continues to be thankful for the co-sponsorship of the journal by the Association of Southeastern Biologists and welcomes its involvement in decisions about the future of the journal!

Respectfully submitted, Joerg-Henner Lotze, Publisher

## ASSOCIATION OF SOUTHEASTERN BIOLOGISTS

Executive Committee Meeting  
April 9, 2003  
Arlington, Virginia

### AIBS Representative's Report

#### ANNUAL MEETING

The 2003 AIBS Annual Meeting was held 21-23 March at the Key Bridge Marriott, Arlington, Virginia. The theme, *Bioethics in a Changing World*, offered biologists the opportunity to hear and discuss new and continuing challenges in the ethical practice of our profession. The primary topics were (1) Responsible Conduct of Science, (2) Public Dissemination of Sensitive Scientific Information, (3) Training the Next Generation, (4) Responsible Use of Pesticides and Fertilizers, and (5) Environmental Justice. The plenary speakers provided thoughtful and often philosophical comments that were later addressed in small group discussions. Additional group topics dealt with broader professional, public policy, social, and pedagogical aspects of bioethics. The full program included a student poster session by 16 undergraduates, a diversity scholars competition, a public policy workshop, a film showing *Hotel Heliconia*, and a performance by Kailulan Lee of the one woman play, "A Sense of Wonder"—based on the life and works of Rachel Carson.

A low registration (89) was attributed to the state of the economy, the threat of bioterrorism, and the war.

President Gary Hartshorn tentatively proposed the theme, *Invasive Species*, for the 2004 meeting which will also be held at the Key Bridge Marriott.

A number of awards were presented, including the AIBS Distinguished Scientist Award to Harold Mooney (Stanford University), the AIBS Outstanding Service Award to Gregory Anderson (University of Connecticut), the Education Award to M. Patricia Morse (University of Washington), the AIBS President's Citation to Hiram College, Ohio, the AIBS Print Media Award to Richard Stone, European News Editor, *Science*, the AIBS Broadcast Media Award to Robin White (Radio College), AIBS Diversity Scholar Awards to De Alma N. Yarbrough (University of Cincinnati), Emilio Bruna (University of Florida), Alicia Y. Williams (Smithsonian Institution), Michael Perkins (Howard University), Alana Roache (Howard University), Pamela Clarke (Howard University), and the AIBS Student Poster Award to De Alma N. Yarbrough (University of Cincinnati).

#### COUNCIL MEETING

The Council Meeting followed an entirely different format—very abbreviated programmatic activity reports by various AIBS staff followed by extensive small group discussions. The idea was to engage the representative in discussions

about the future of the discipline. The topics were Biological Education, Curricula and Workforce Issues, Biological Research Funding Challenges, and Biological Research Infrastructure. The sessions began on Sunday afternoon and continued through mid-day on Monday.

The issue of poor attendance at the annual meeting was addressed during the Council Meeting. It was stated that the organization fairs well as an umbrella organization in dealing with higher-level interactions with member organizations and their leadership but has not been comparably successful at lower level interactions. The leadership is considering several alternatives to the present meeting format. Among these alternatives are (1) reducing the annual meeting to a quadrennial event (every four years), while at the same time holding more one-day roundtables and special lectures during any given year, and continuing to build the annual AIBS Council Meeting into an annual mini-summit for membership leaders, or (2) condensing the annual meeting format of plenary speakers and breakout discussion groups down to a half-day or one-day symposium that could be taken on the road several times each year as part of the program of several of our member societies at their annual meeting.

## **AIBS ACTIVITIES**

The key aspects of the Executive Director's report included (1) the proposed launching of the Biology Chairs Communication Network, (2) the continued success and growth of the IBRCS (Infrastructure for Biology at Regional to Continental Scales) project and the release of the related white paper, (3) the regrouping of educational activities, (4) the continued outstanding performance of *BioScience*, (5) the flat/eroding individual membership levels and the cessation of the membership drive, (6) low annual meeting registration, (7) an outline of an AIBS history project, (8) the outline of an AIBS development/fundraising activity, and (9) the continued success and growth of the Information Technology Department.

Other noted activities included (1) successful fundraising activities by the Public Policy Office that lead to the hiring of a second policy staff member, (2) a request that AIBS submit a proposal in support of the National Ecological Observatory Network (NEON), and (3) a restructuring of the Public Policy Office with respect to research funding, educational policy, and research regulations. AIBS remains active in the Coalition for National Science Funding (CNSF), a coalition of over 80 organizations interested in promoting the NSF. AIBS was one of four societies asked to participate in a CNSF meeting with the House Appropriations staff regarding the status of NSF funding in the FY03 omnibus appropriations bill.

AIBS is an active member in Science, Engineering and Technology Working Group (SETWG) and will participate again in the Congressional Visits Day. There is concern that engineering and technology fields have dominated the event in the past. An award will be presented to Rep. Nick Smith (Michigan), chair, House Science Research Subcommittee.

The AIBS Policy Office coordinated a meeting of biology policy professionals with the House Science Committee to discuss concerns about the language in the NSF bill that might have been interpreted as favoring math and physical sciences over other disciplines. The language was subsequently dropped from the bill.

In January 2003, the Public Policy Office learned that the National Research Council (NRC) was preparing an assessment of research doctoral programs. Several evolutionary biologists expressed concern with the draft of the life sciences profile that would have identified the fields of biology to be ranked. Specifically, the draft taxonomy did not include the field of evolutionary biology and linked ecology with environmental science.

The AIBS Developmental Committee strongly recommended the development of a brochure for developmental purposes and the initiation of annual giving, planned giving, and special funding programs.

The representatives were reminded that each member organization is entitled to one free ad in *BioScience* each year.

Respectfully submitted,  
Geraldine W. Twitty  
ASB Representative to AIBS



From left to right: Marilyn Caponetti, Carolyn Shull, and Antoinette Frederick at the annual banquet.

## ASSOCIATION OF SOUTHEASTERN BIOLOGISTS

Executive Committee Meeting  
April 9, 2003  
Arlington, Virginia

### Report of the Archivist

As I mentioned in my report sent to the Executive Committee meeting, September 14, 2002, I met with Steven Brown, Head of University Archives and Records Management, Hargrett Library, University of Georgia, on December 18, 2002. We had a lengthy and very productive discussion of the ASB Archives, and I feel that we now have a very workable plan for periodically moving archived material from Columbia to Athens and for maintaining the archives through a system that will probably require very little change in the foreseeable future.

Attached with this report is a copy of the system now in force which at first view will seem to you unchanged from the last version presented to the Executive Committee. And, indeed, only one change has been made with the addition of a new item in "*Series 2—Executive File:*" viz., item "*2.5—System Development and Reports.*" As minor as this change is, the addition of it illustrates the need for this new category. If you examine all past reports from the archivist, you will find that the system for archiving association documents regarded to have historical importance has undergone significant changes since it was first presented in 2000. Obviously, the evolution of the system itself may have historical value, and so with this new category, we will have a record of future changes. Steven Brown suggested the addition of this category. He also suggested that the attached classification system document be incorporated with the *Finders Guide* that is to be furnished to any researcher engaged in study of the *Association of Southeastern Biologists*, and this change too has been implemented.

Our archives are well maintained in a large room where temperature and humidity are very carefully controlled. The shelves bearing our documents are compacted so to occupy an enclosed space until wheels of the compactor are turned to open an aisle between our shelves and the adjacent ones. On those adjacent shelves, one will find the archives of the *Ecological Society of America*; appropriate, I believe, given one of the present foci of ASB. At the end of the aisle leading to the ASB Archives is an old typewriter which stands as a good landmark for the location of our documents when the compactor is closed. It is not just *any* old typewriter; it is Eugene Odum's typewriter with which he produced the drafts of all editions of *Fundamentals of Ecology*. I hope it is not moved to another location.

From time to time I will carry archived documents to the Hargrett Library of the University of Georgia. My original plan was to take them every five years, but Steven and I decided that I should bring all items so far accumulated by the close

of the 2002-2003 ASB year (i.e., the year that ends with the banquet at the 64<sup>th</sup> annual meeting). So, when all reports and other items for that year reach my files, I'll take (emphasize *take*) all documents accumulated during my tenure as archivist to the University of Georgia. Be assured, I will not trust our archives to the U. S. Postal System (even though it is probably the safest one in the world).

I appreciate your attention, and I am certainly willing to attempt answers for any questions you may have.

Respectfully submitted,  
J. M. Herr, Jr.

## **THE ARCHIVES OF THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS**

### **Series 1. – Agenda and Minutes:**

- 1.1 Executive Committee Meetings – Fall; before and after annual meeting (by date). **Folder, 5 years**
- 1.2 Annual Meeting. **Folder, 5 years**
- 1.3 General Correspondence. **Folder, 1 year**

### **Series 2. – Executive File:**

- 2.1 President, Vice-President, and President-elect – Reports and Letters. **Folder, 1 year**
- 2.2 Treasurer – Reports and Letters. **Folder, 5 years**
- 2.3 Secretary – Reports (beyond minutes) and Letters. **Folder, 5 years**
- 2.4 Membership Officer. **Folder, 5 years**
- 2.5 Archives – System Development and Reports. **Folder, 5 years**

### **Series 3. – Annual Reports (Operations):**

- 3.1 Auditing Committee. **Folder, 5 years**
- 3.2 Enrichment Fund Board. **Folder, 5 years**
- 3.3 Finance Committee (beyond Treasurer's report). **Folder, 5 years**
- 3.4 Local Arrangements and Program Committee. **Folder, 5 years**
- 3.5 Nominating Committee. **Folder, 5 years**
- 3.6 Resolutions Committee. **Folder, 5 years**
- 3.7 Patron Member and Exhibitor Committee. **Folder, 5 years**
- 3.8 Print Editor, *Southeastern Biology*. **Folder, 5 years**

### **Series 4. – Annual Reports (Awards):**

- 4.1 Graduate Student Support Award Committee. **Folder, 5 years**
- 4.2 Meritorious Teaching Award Committee. **Folder, 1 year**
- 4.3 Poster Awards Committee. **Folder, 5 years**
- 4.4 Research Awards Committee – Faculty. **Folder, 5 years**
- 4.5 Research Awards Committee – Student. **Folder, 5 years**
- 4.6 Award Announcements by Societies Meeting with ASB. **Folder, 5 years**

**Series 5. – Periodical Reports**

- 5.1 Committee on Women, Minorities and the Disabled. *Folder, 5 years*
- 5.2 Conservation Committee. *Folder, 5 years*
- 5.3 Education Committee. *Folder, 5 years*
- 5.4 Place of Meeting Committee. *Folder, 5 years*
- 5.5 Publications Committee. *Folder, 5 years*
- 5.6 Past President's Council. *Folder, 5 years*
- 5.7 AIBS/AAAS Reports. *Folder, 5 years*

**Series 6. – Special Documents:**

- 6.1 Current Documents – Constitution and Bylaws.
- 6.2 Revised Documents – Constitution and Bylaws.
- 6.3 Amendments – Constitution and Bylaws. *Folder, 5 years*
- 6.4 Miscellaneous Documents (Periodically Prepared).

**Series 7. – Miscellaneous Folders:**

- 7.1 Identifiable Photographs. *Photobook, 5 years*
- 7.2 Items from Unanticipated Sources. *Folder, 5 years*



John Herr (left) converses with Claudia Jolls.

## **ASB BANQUET ADDRESS**

Robert R. Haynes  
Past-President of ASB  
Department of Biological Sciences  
The University of Alabama  
Tuscaloosa, AL 35487-0345

### ***Adaptations of Aquatic Plants***

For plants to survive there must be available light, oxygen, carbon dioxide, nutrients, and water. The precursors to land plants probably existed in an aquatic environment, particularly the marine environment. These precursors most likely existed near the water surface and to a depth to which light can penetrate. Consequently, all of the essentials for plant life were readily available to each cell as oxygen, carbon dioxide, and nutrients were most likely dissolved in the water.

In a terrestrial environment, however, water and nutrients, especially are not readily available. Certain adaptations were essential, therefore, before plant life in a terrestrial environment could be successful. These adaptations included, among others, a structural system, a transport system, some method to retard water loss, and some method to allow free exchange of atmospheric gases. Such adaptations were necessary since light does not penetrate soil as readily as it does water. Plants must have structure, therefore, to support certain organs above the soil so that those organs are bathed in light, making photosynthesis possible. Water and nutrients mostly are available in the soil, and not the atmosphere; hence, the necessity of a transport or vascular system. Water in the soil is limited, therefore, a method of to prevent water loss to the atmosphere became necessary; hence a layer of waxy substance, cuticle, evolved. Finally, carbon dioxide, which does not readily diffuse through cuticle, is required for photosynthesis. Small openings in the cuticle, or stomata, evolved which allow free exchange of gases between the surrounding atmosphere and the interior of the plant.

As plants diversified on Earth, some vascular plants became adapted to survive in an aquatic environment, both fresh water and marine. This migration back to an aquatic environment necessitated a completely different set of adaptations that that of their terrestrial relatives. These different adaptations are necessitated in particular because CO<sub>2</sub>, although available in water, is in much more limited supply than in the atmosphere. Also, sexual reproduction is more difficult since transfer of pollen to anther (pollination) is more difficult in an aqueous environment.

#### **Causes of limited CO<sub>2</sub>**

Saturation levels of CO<sub>2</sub> in water are much lower than the normal concentrations of CO<sub>2</sub> in the atmosphere. In addition, diffusion rates of CO<sub>2</sub> in water are several times less than that in the atmosphere. In an aqueous environment, consequently, whenever CO<sub>2</sub> is absorbed by a plant for

photosynthesis, water surrounding the plant rapidly becomes depleted of CO<sub>2</sub> and replacement by diffusion takes much longer than in a terrestrial environment. Of course, flowing water can replace CO<sub>2</sub> depleted water with CO<sub>2</sub> rich water. A phenomenon known as the Prandtl layer negates most, if not all, of the effect of flowing water.

The Prandtl layer, a theory of fluid mechanics, was described by a 19<sup>th</sup> century German scientist (Dr. Prandtl). The theory essentially states that as fluid moves past an object suspended in that fluid, the molecules of the fluid become disturbed and move around the object, leaving a layer of non-moving fluid that surrounds the object. The thickness of this non-moving layer is controlled by the mass of the fluid (the greater the mass the thicker the layer), the viscosity of the fluid (the greater the viscosity the thicker the layer), and the compressibility of the fluid (the more compressible the thinner the layer). Water has greater mass, has greater viscosity, and is less compressible than are atmospheric gases. Consequently, Prandtl layer around plants in water is considerably thicker than around plants in the atmosphere. As CO<sub>2</sub> is depleted from water surrounding plant leaves, it is replenished much more slowly because not only does it diffuse more slowly in water, but it also has a much wider area through which it must diffuse.

In addition to a Prandtl layer, there may be no dissolved CO<sub>2</sub> in the water at all. Whenever, for example, pH is above 9.5, there is no dissolved CO<sub>2</sub> in water whatsoever. This lack of CO<sub>2</sub> happens especially in shallow pools where the pH rises continually during the day whenever photosynthesis is occurring until there is absolutely no available CO<sub>2</sub> for photosynthesis. The pH, however, decreases the next night whenever photosynthesis is not occurring, freeing CO<sub>2</sub> for photosynthesis the next day.

### **Adaptations for limited CO<sub>2</sub>**

Adaptations for limited CO<sub>2</sub> are both physiological and morphological. Physiological adaptations include utilization of bicarbonates as a carbon source and alternative methods of photosynthesis, such as Crassulacean Acid Metabolism (CAM).

Certain aquatic flowering plants can utilize bicarbonates as a carbon source for photosynthesis, the only plants capable of doing so. These species can inhabit extremely hard water lakes, ones in which most of the CO<sub>2</sub> is bonded to calcium, with little or no CO<sub>2</sub> in dissolved state. Aquatic species incapable of bicarbonate utilization do not inhabit such lakes. Bicarbonate utilization species often develop a layer of calcium carbonate (marl) on the leaves, which is especially evident after specimens have dried. This marl is a result of bicarbonates entering the abaxial surface of the leaf and exiting the adaxial surface, where it precipitates.

CAM photosynthesis is especially important for plants incapable of utilizing bicarbonates as a carbon source and that inhabit shallow bodies of water. The pH usually rises during the day, reaching a level where there is no dissolved CO<sub>2</sub> available. Enough photosynthesis to sustain life cannot occur with normal photosynthetic process. Instead, these plants utilize CAM photosynthesis. During the night, as the pH levels decrease, some CO<sub>2</sub> becomes dissolved in the water.

The plants absorb this dissolved  $\text{CO}_2$  and store it in the form of an organic acid, often malic acid. Once enough light is available for photosynthesis,  $\text{CO}_2$  is released from the organic acid and utilized in photosynthesis as normal. CAM photosynthesis was first observed among members of the Crassulaceae, a group of stoneworts that inhabit arid or desert conditions. In this case, the stomata are open at night and closed during the day as a method of conserving water. Other desert inhabiting plants, such as the Cactaceae, also utilize this method of photosynthesis.

Morphological adaptations include emergent habit (vegetation projected above surface of water), floating leaves, thin epidermis, hydropoten, increase surface to volume ratio, and aerenchyma. Floating leaves are exposed to two different environmental conditions simultaneously. The adaxial surface is exposed to air and the abaxial surface to water. Since air contains adequate  $\text{CO}_2$ , stomata are in the adaxial epidermis, allowing free exchange of gases with the mesophyll. There are no stomata on the abaxial epidermis. Submersed leaves are immersed in water, so there is no loss of water vapor through the epidermis. Cuticle, therefore, does not cover the epidermis of submersed leaves. Dissolved gases and any dissolved nutrients can be freely exchanged between the mesophyll and surrounding water. Hydropoten are specialized cells through which bicarbonates can diffuse. These hydropoten occur only on leaves of aquatic flowering plants capable of utilizing bicarbonates as a carbon source. Leaf surface to volume ratio is increased by either dissected leaves or long, flat, narrow leaves. Surface area to volume ratio is important because with greater surface area, there is more area available for diffusion of dissolved  $\text{CO}_2$ . Many aquatic plants produce extensive aerenchyma, large intracellular air spaces. In these air spaces, gases are temporarily stored, including  $\text{CO}_2$  following respiration and  $\text{O}_2$  following photosynthesis. Whenever the gases are needed in the metabolic activity of the plant, they diffuse from the aerenchyma into the cells in which they will be utilized.

### Reproductive adaptations

Adaptations for reproduction include both vegetative methods and methods of pollen transfer. Aquatic environment often makes flowering or sexual reproduction difficult. Many species, consequently, have evolved methods of vegetative reproduction. Methods of vegetative reproduction include budding, turions, and stolons. Budding is characteristic of Lemnaceae (duckweeds) reproduction in which a daughter plant is vegetatively from the parent plant. Turions are hardened stem apices that fall from the parent plant to the substrate. The turions lie dormant during a time unfavorable for growth, which includes winter (most common in North America), hot summer, or a dry period. Once the unfavorable season has past, the turion begins growth and culminates in a mature plant. *Hydrilla* (Florida elodea), a very invasive tropical weed produces numerous turions each year. It is by the production of these turions that *Hydrilla* is capable of overgrowing a body of water and nearly eliminating native species of plants. Stolons are horizontal leafless stems that produce an erect stem at their apex. *Eichhornia crassipes* (water-hyacinth) is an excellent example of a species that can cover a body of water utilizing stolons as method of vegetative reproduction.

Adaptations for pollination, or the transfer of pollen from the anther to the stigma, are necessary. A few species, such as *Utricularia inflata* (bladderwort) or *Sagittaria guayanensis* (arrowhead), utilize methods of their terrestrial ancestors. Flowers are produced at surface of water or above water surface and pollen transfer occurs via wind or animal vectors. Many other species utilize the water itself as the vector for pollen transfer.

### Water transport of pollen

Transport of pollen by water may occur on the water surface or in the water column. Water surface transfer occurs in form of mucilaginous rafts or in free-floating staminate flowers. Mucilaginous rafts occur when all of the pollen from one anther chamber adheres together in a mucilaginous matrix. This matrix rises to the surface and floats, drifting with the wind. In marine environments, the pollen is released at low tide. During low tide, stigmas are usually exposed and can be quite elongate, as in *Halophila*, or quite enlarged and almost funnel-shaped, as in *Zannichellia*. A large mass of pollen is more likely to contact a stigma than one individual grain, and, of course, an elongate or enlarged stigma is more likely to be contacted than a minute one. There are several species that utilize water surface pollen transfer, including *Ruppia*, *Lipilaena*, and *Phyllospadix*. The latter genus not only utilizes surface transfer, but also submersed pollen transfer. Flowers that are exposed have their pollen matrix float, but those that are not exposed to air have their pollen matrix move immersed along in the water current.

Several species of Hydrocharitaceae have staminate flowers produced below the water surface, and these flowers break off and rise to the water surface. As they break through the water surface, there is considerable lowering of external pressure. Pressure inside the flower causes it to open quite rapidly. They may throw pollen out randomly as they open, as in *Hydrilla*, or they may float along on the water surface. As the pollen of *Hydrilla* is released from the anther, some may contact a stigma as it falls. If so, that pollen germinates and may function in fertilization. All pollen that lands of the water surface is lost to deterioration. *Elodea* floats momentarily and then releases its pollen onto the water surface, where the pollen floats until it contacts a stigma or is lost to deterioration. Finally, the staminate flowers of *Vallisneria* float along until they contact a stigma or until they die. If a stigma is contacted by an anther of a floating staminate flower, then pollen transfer is directly from the anther to the stigma.

Water column transfer of pollen may be either by staminate flowers produced above carpellate flowers or by pollen retained within an air bubble. In *Najas*, the staminate flowers are produced distally on the plant, and the carpellate flowers are produced proximally. As anthers dehisce, the pollen, which is heavier than water, is released and sinks. As it sinks through the water column, it might contact a stigma. Otherwise, the pollen will fall to the substrate and deteriorate. In submersed flowers of *Potamogeton*, as the anthers open, all of the pollen inside that anther adheres together in an air bubble that was released with as the anther opened. This air bubble begins to rise and if a stigma is contacted, pollination is accomplished. Otherwise, the pollen will deteriorate if it reaches the water surface.

### Summary

The aquatic environment presents completely different environmental conditions than does the terrestrial environment. Adaptations that are suited for terrestrial conditions may not be adequate in an aquatic environment. Certain adaptations are necessary, therefore, if a species is to survive in an aquatic environment. These adaptations include physiological and morphological for limited CO<sub>2</sub> and vegetative and pollination to increase possibility of reproduction.



Antoinette and Lafayette Frederick.

**ASSOCIATION OF SOUTHEASTERN BIOLOGISTS  
TREASURER'S REPORT, FY 1 JANUARY–31 DECEMBER 2002**

<b>I. BEGINNING BALANCE</b> (Actual bank balance, 31 Dec. 2001)		<b>\$ 96,713</b>
<b>II. RECEIPTS</b>		
Non-Patron Dues	14,250	
Patron Dues	2,000	
Meeting Revenue	9,000	
Sales	53	
Enrichment Fund	820	
Interest	1,034	
Carolina Biological Supply Co., Meritorious Teaching Award	1,500	
<b>TOTAL RECEIPTS</b>		<b>\$ 28,657</b>
<b>III. TOTAL RECEIPTS AND BEGINNING BALANCE</b>		<b>\$125,370</b>
<b>IV. DISBURSEMENTS</b>		
1. Dues Notice		<b>0</b>
2. Publications		
ASB Bulletin 48(4)	2,102	
ASB Bulletin 49(1)	2,129	
ASB Bulletin 49(2)	5,930	
ASB Bulletin 49(3)	4,782	
ASB Bulletin 49(4)	2,245	
Publications Total		<b>17,188</b>
3. Office Expenses		<b>431</b>
4. Official Travel		<b>0</b>
5. Awards and Honoraria		
Graduate Student Support Grants	3,872	
Speaker Honorarium	1,000	
Speaker Travel	520	
Aquatic Biology Award	200	
ASB Research Awards	1,200	
Certificates/Plaques	361	
ASB Poster Award	600	
Carolina Biological Teaching Award	1,500	
Outstanding Science Teachers	500	
Total Awards		<b>9,753</b>
6. Interim Meeting		<b>458</b>
7. Miscellaneous		
Affiliations	100	
Local Committee	1,000	
Symposia, Workshops	324	
Bank Charges	482	
Web Site	665	
Liability Insurance	586	
Total Miscellaneous		<b>3,157</b>
<b>TOTAL DISBURSEMENTS</b>		<b>\$ 30,987</b>
<b>V. ENDING BALANCE</b> (Actual bank balance, 31 December 2002)		<b>\$ 94,383</b>
<b>VI. NET CHANGE (DECREASE) FOR 2002</b>		<b>(\$ 2,330)</b>

**ASSOCIATION OF SOUTHEASTERN BIOLOGISTS  
2002 BUDGET ON 31 DECEMBER 2002**

<b>I. RECEIPTS</b>	<b>Budget</b>	<b>Actual</b>	<b>Difference</b>
Non-Patron Dues	23,000	14,250	(8,750)
Patron Dues	3,500	2,000	(1,500)
Interest	4,000	1,034	(2,966)
Meeting Revenue	5,000	9,000	4,000
Sales	0	53	53
Carolina Biological Supply Co.			
Teaching Award	1,500	1,500	0
Martin Microscope Student			
Research Award	600	0	(600)
Aquatic Biology Award	200	0	(200)
Enrichment	0	820	820
<b>TOTAL RECEIPTS</b>	<b>\$37,800</b>	<b>\$28,657</b>	<b>(\$9,143)</b>
<b>II. DISBURSEMENTS</b>			
1. Dues Notice	0	0	0
2. Publications			
ASB Bulletin 48(4)	0	2,102	(2,102)
ASB Bulletin 49(1)	3,000	2,129	871
ASB Bulletin 49(2)	8,000	5,930	2,070
ASB Bulletin 49(3)	3,500	4,782	(1,282)
ASB Bulletin 49(4)	3,000	2,245	755
3. Office Expenses	300	431	(131)
4. Official Travel	1,500	0	1,500
5. Awards and Honoraria			
Grad. Student Support Grants	7,500	3,872	3,628
Aquatic Biology Award	200	200	0
Speaker Honorarium	1,000	1,000	0
Speaker Travel	1,000	520	480
Research Awards	1,200	1,200	0
Certificates/Plaques	300	361	(61)
Poster Award	300	600	(300)
Carolina Bio Sup Teaching Award	1,500	1,500	0
Outstanding Teachers	1,000	500	500
6. Interim Meeting	500	458	42
7. Liability Insurance	550	586	(36)
8. Affiliations	200	100	100
9. Local Committee (DC)	500	1,000	(500)
10. Symposia, Workshops	2,000	324	1,676
11. Bank Charges	250	482	(232)
12. Web Site	500	665	(165)
<b>TOTAL DISBURSEMENTS</b>	<b>\$37,800</b>	<b>\$30,987</b>	<b>\$6,813</b>
<b>III. BALANCE</b>	<b>\$0</b>	<b>(\$2,330)</b>	<b>(\$2,330)</b>

**ASSOCIATION OF SOUTHEASTERN BIOLOGISTS  
2004 PROPOSED BUDGET**

<b>I.</b>	<b>BEGINNING BALANCE</b>		<b>\$ 0</b>
<b>II.</b>	<b>RECEIPTS</b>		
	Non-Patron Dues	19,000	
	Patron Dues	3,000	
	Interest	2,000	
	Meeting Revenue	7,000	
	Carolina Biological Sup. Co. Teaching Award	1,500	
	Martin Microscope Student Research Award	600	
	Aquatic Biology Award	200	
	Enrichment	1,000	
	<b>TOTAL RECEIPTS</b>		<b>\$34,300</b>
<b>III.</b>	<b>TOTAL RECEIPTS AND BEGINNING BALANCE</b>		<b>\$34,300</b>
<b>IV.</b>	<b>DISBURSEMENTS</b>		
	1. Dues Notice	0	
	2. Publication		
	ASB Bulletin 51(1)	2,000	
	ASB Bulletin 51(2)	6,000	
	ASB Bulletin 51(3)	5,000	
	ASB Bulletin 51(4)	2,500	
	Total Publication	15,500	
	3. Office Expenses	400	
	4. Official Travel	1,000	
	5. Awards and Honoraria		
	Graduate Student Support	7,500	
	Aquatic Biology Award	200	
	Speaker Honorarium	1,000	
	Speaker Travel	700	
	Research Awards	1,200	
	Certificates/Plaques	200	
	Poster Award	300	
	Carolina Bio Teaching Award	1,500	
	Outstanding Teachers	500	
	Total Awards and Honoraria	13,400	
	6. Interim Meeting	500	
	7. Liability Insurance	600	
	8. Affiliations	200	
	9. Local Committee	1,000	
	10. Symposia, Workshops	1,000	
	11. Bank Charges	500	
	12. Web Site	500	
	<b>TOTAL DISBURSEMENTS</b>		<b>\$34,300</b>
<b>V.</b>	<b>NET BALANCE FOR YEAR</b>		<b>\$ 0</b>
<b>VI.</b>	<b>ENDING BALANCE</b>		<b>\$ 0</b>

**ASSOCIATION OF SOUTHEASTERN BIOLOGISTS  
ENRICHMENT FUND**

**1 JANUARY – 31 DECEMBER 2002**

<b>I.</b>	<b>BEGINNING BALANCE</b>		<b>\$37,266</b>
<b>II.</b>	<b>RECEIPTS</b>		
	1. Contributions	820	
	2. Interest	1,034	
	Total		1,854
<b>III.</b>	<b>TOTAL RECEIPTS AND BEGINNING BALANCE</b>		<b>\$39,120</b>
<b>IV.</b>	<b>TOTAL DISBURSEMENTS</b>		<b>\$ 500</b>
<b>V.</b>	<b>ENDING BALANCE</b>		<b>\$38,620</b>
<b>VI.</b>	<b>NET CHANGE</b>		<b>\$ 1,354</b>

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**ASSOCIATION OF SOUTHEASTERN BIOLOGISTS  
BANK ACCOUNTS**

**31 DECEMBER 2001**

<b>I.</b>	<b>MERRILL LYNCH</b>		<b>\$41,392</b>
<b>II.</b>	<b>WACHOVIA</b>		<b>\$55,321</b>
	<b>TOTAL</b>		<b>\$96,713</b>

**31 DECEMBER 2002**

<b>I.</b>	<b>MERRILL LYNCH</b>		<b>\$13,117</b>
<b>II.</b>	<b>WACHOVIA</b>		<b>\$81,266</b>
	<b>TOTAL</b>		<b>\$94,383</b>
<b>DECREASE OF 2002 FROM 2001</b>			<b>\$ 2,330</b>

## ASSOCIATION OF SOUTHEASTERN BIOLOGISTS MEMBERSHIP OFFICER'S REPORT

### 2003 ASB DECEASED MEMBERS

Catherine Keever  
Dekalb Russell

### 2003 ASB EMERITUS STATUS REQUESTS

Charles Boehms	Donald J. Shure
John J. Just	Don Windler
Joe Ann Lever	

CURRENT MEMBERSHIP	April 2002	April 2003
Complimentary	11	11
Contributing	7	9
Emeritus	55	63
Family	29	28
Library	46	55
Life	0	6
Patron	5	5
Regular	513	655
Student	254	360
Sustaining	2	3
<b>TOTAL</b>	<b>922</b>	<b>1,195</b>

Respectfully submitted,  
DEBORAH K. ATKINSON, ASB Membership Officer



Friday night banquet at the Hyatt Regency Crystal City,  
Arlington, Virginia.

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## **ASB *Southeastern Biology* Staff, ASB Officers, and Executive Committee Members-at-Large, 2003-2004**

Telephone numbers, FAX numbers and e-mail addresses can be found on the inside front cover of each issue of the *Southeastern Biology*.

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<b>Print Editor</b>	James D. Caponetti, Department of Botany, University of Tennessee, Knoxville, TN
<b>Associate Editor</b>	Terry Richardson, Department of Biology, University of North Alabama, Florence, AL
<b>Web Editor</b>	Howard Neufeld, Department of Biology, Appalachian State University, Boone, NC
<b>Business Manager</b>	Tim Atkinson, Carolina Biological Supply Company, Burlington, NC
<b>News Editor</b>	Jon Fortman, Division of Science and Math, Mississippi University for Women, Columbus, MS
<b>Book Review Editor</b>	James Ross, Cumberland College, Williamsburg, KY

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2005:	Zack E. Murrell, Dept. of Biology, Appalachian State Univ., Boone, NC Thomas R. Wentworth, Dept. of Botany, North Carolina State Univ., Raleigh, NC
2006:	Debbie Moore, Dept. of Natural Sciences, Troy State Univ., Dothan, AL Jerry C. Ritchie, USDA-ARS Hydrology Laboratory, Beltsville, MD

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## ASB COMMITTEES 2003-04

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### Representatives to Other Societies

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#### ACS - Associations of Systematic Collections

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#### AIBS American Institute of Biological Science

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#### Committee on Women, Minorities and Persons with Disabilities

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### Enrichment Fund Board

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**President Elect: Claudia Jolls**, Department of Biology, East Carolina University, Greenville, NC 27858, 252 328-6295, jollsc@mail.ecu.edu.

**Executive Committee Member, Zack Murrell**, Department of Biology, Appalachian State University, Boone, NC 28608-2027, 828 262-2674, murrellze@appstate.edu.

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**Chair: Scott Franklin**, Department of Biology, Ellington Hall, 3700 Walker Avenue, Memphis, Tennessee 38152, 901 678-5539, FAX 901 678-4746, sfrankli@memphis.edu.

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#### Poster Awards Committee

**Chair: Rick Duffield**, Dept. of Biology, Howard University, Washington, DC 20059, 202 806-6127, FAX 202 806-4564, *rduffield@fac.howard.edu*.

**Dennis Haney**, Dept. of Biology, Furman University, 3300 Poinsett Highway, Greenville, SC 29613-0418, 864 294-2050, FAX 864 294-2058, *dennis.haney@furman.edu*.

**Victoria Turgeon**, Furman University, 3300 Poinsett Highway, Greenville, SC 29613, 864 294-3791, FAX 864 294-2058, *victoria.turgeon@furman.edu*.

**Mijitaba Hamissou**, Jacksonville State University, Jacksonville, AL 36265, 256 782-5040, *taba@jsucc.jsu.edu*.

**Gerhard Kalmus**, Department of Biology, East Carolina University, Greenville, NC 27858, 252 328-6306, *Kalmusg@mail.ecu.edu*.

#### Publications Committee

**Chair: Joe Pollard**, Dept. of Biol., Furman University, 3300 Poinsett Highway Greenville, SC 29613-0418, 864 294-3249, FAX 864 294-2058, *joe.pollard@furman.edu*.

**Bulletin Editor: Jim Caponetti**, Dept of Biology, 437 Hesler Hall, University of Tennessee, Knoxville, TN 37996, 865 974-6219, FAX 865 974-2258, *jcaponet@utk.edu*.

**Tom Wentworth**, Department of Botany, 4206 Gardner Hall, Campus Box 7612, North Carolina State University, Raleigh, NC 27695, 919 515-2168, *tom\_wentworth@ncsu.edu*.

**Debbie Moore**, Department of Natural Sciences, Troy State University Dothan, P.O. Box 8368, Dothan, AL 36304, 334 983-6556 Ext. 250, FAX 334 983-6322, *dmoore@tsud.edu*.

#### Research Awards Committee Senior

**Chair: Cliff Hupp**, USGS, 430 National Center, Reston, VA 20192, 703 648-5207, *crhupp@usgs.gov*.

**Ray Williams**, Appalachian State University, Boone NC 28608-2027, 828-262-6511, *willmsrs@appstate.edu*.

**Lisa Kelly**, UNC Pembroke, P.O. Box 1510, Pembroke NC 28372-1510, 910 521-6377, FAX 910 521-6649, *Lisa.Kelly@uncp.edu*.

#### Research Awards Committee Student

**Chair: L. J. Davenport**, Department of Biology, Samford University, Birmingham, AL 35229, 205 870-2584, FAX: 205 870-2479, *ljdavenp@samford.edu*.

**George Cline**, Department of Biology, Jacksonville State University, Jacksonville, AL 36265, 256 782-5798, *gcline@jsucc.jsu.edu*.

**Katie Greenberg**, USDA Forest Service, Bent Creek Experimental Forest, 1577 Brevard Rd., Asheville, NC 28806; 828 667-5261 Ext. 118 FAX 828 667-9097, <mailto:kgreenberg@fs.fed.us>.

**Resolutions Committee**

**Chair: Ken Shull**, Department of Biology, Appalachian State University, Boone, NC 28608-2027, 828 262-2675, FAX 828 262-2127, [Shulljk@appstate.edu](mailto:Shulljk@appstate.edu).

**Bruce Ezell**, Department of Biology, UNC Pembroke, P.O. Box 1510, Pembroke, NC 28372-1510, 910 521-6421, FAX 910 521-6649, [William.Ezell@uncp.edu](mailto:William.Ezell@uncp.edu).

**Scott Franklin**, Department of Biology, Ellington Hall, 3700 Walker Avenue, Memphis, TN 38152, 901 678-5539, FAX 901 678-4746, [sfrankli@memphis.edu](mailto:sfrankli@memphis.edu).

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Marilyn and Jim Caponetti.

## 2004 MEETING OF THE ASSOCIATION

**CALL FOR PAPERS****THE 65<sup>TH</sup> ANNUAL MEETING****HOSTS: UNIVERSITY OF MEMPHIS,  
CHRISTIAN BROTHERS UNIVERSITY,  
AND RHODES COLLEGE****MEETING SITE: MEMPHIS, TN****DATE: 14-17 APRIL 2004****NOTE WELL!**

This will be the only call for papers!

Please note the following deadlines that are to be met before our 65<sup>th</sup> annual meeting.

- 14 NOVEMBER** Titles and abstracts of papers and posters. This will be the *only* call for papers. They must reach the program chairman by this date.
- 17 OCTOBER** Nominations for ASB officers and executive committee.
- 17 NOVEMBER–9 JANUARY** Submissions for research awards.
- 16 JANUARY** Application for student travel awards.

Preliminary Meeting Web Page

<http://www.memphis.edu/asb>

**LOCAL COMMITTEE ASSIGNMENTS  
FOR THE 65th ANNUAL MEETING  
UNIVERSITY OF MEMPHIS, CHRISTIAN BROTHERS  
UNIVERSITY & RHODES COLLEGE  
MEMPHIS, TN**

*Local Arrangements**Co-Chair:*

Mel Beck

901-678-2970

mbeck@memphis.edu

*Co-Chair:*

Scott Franklin

901-678-5539

sfrankli@memphis.edu

*Program Chair:*

Scott Franklin

*Web Master:*

Steve Conlee (U Memphis IT)

901-678-5506

sconlee@memphis.edu

*Beta Beta Beta:*

Mary Ogilvie (CBU)

901-321-3437

mogilvie@cbu.edu

*Commercial Exhibits:*

Mike Kennedy

901-678-2597

mlkenndy@memphis.edu

Mel Beck

*Workshops/Symposiums:*

Matthew Parris

901-678-4408

mparris@memphis.edu

*Promotions:*

Charlie Biggers

901-678-4468

cbiggers@memphis.edu

*Field Trips:*

Jack Grubaugh

901-678-5487

*Posters and Audiovisual:*

Mike Kennedy

Mel Beck

*Registration/Meeting*

Bill Simco

901-678-2594

*Statistics:*

bsimco@memphis.edu

*Social Events:*

Alan Jaslow (Rhodes)

901-843-3602

Ajaslow@rhodes.edu

Malinda Fitzgerald (CBU)

901-321-3262

malinda@cbu.edu

*Transportation/Parking/*

Alan Jaslow

*Tourism:*

Malinda Fitzgerald

## PAPER & POSTER SUBMISSION DOCUMENTS FOR 2004 MEETING

**DEADLINE: 14 NOVEMBER 2003**

**Individuals presenting papers or posters are expected to be members of ASB!**

### INSTRUCTIONS FOR SUBMITTING ABSTRACTS

Submit the following information and your abstract via the web site (<http://www.memphis.edu/asb>). Please DO NOT submit author information or abstracts by e-mail or regular post.

1. AUTHOR
2. INSTITUTION
3. 1<sup>ST</sup> AUTHOR PHONE/FAX
4. 1<sup>ST</sup> AUTHOR E-MAIL
5. TITLE
6. PRESENTATION: PAPER or POSTER
7. **ALL PRESENTATIONS SHOULD BE ON POWERPOINT WITH A BACKUP COPY ON OVERHEAD! SLIDE PROJECTORS WILL NOT BE AVAILABLE.**
8. Choose the appropriate section(s) to which your paper or poster should be assigned. If you choose more than one, rank sections as to your preference (1 = most preferred).

Animal Behavior  
 Animal Ecology  
 Animal Physiology  
 Aquatic, Wetland & Marine  
 Management  
 Developmental Biology  
 Genetics, Cell & Molecular  
 Biology  
 Herpetology  
 Ichthyology

Invertebrate Zoology &  
 Entomology  
 Microbiology  
 Ornithology  
 Parasitology  
 Plant Biology  
 Plant Ecology  
 Plant Systematics  
 Teaching Biology

9. Awards: If you intend to apply for one of the following awards, please indicate this below so that the Program Committee can schedule talks appropriately. See this issue of *Southeastern Biology* for specific application instructions. You must check that you want to be considered for an award during the abstract submission. Students must be first authors for student awards.

ASB Senior Research Award (\$600)  
ASB Student Research Award (\$1,000)  
ASB Student Research Award in Aquatic Biology (\$200)  
ASB Student Poster Award (\$300)  
Eugene P. Odum Award (\$500)  
NC Botanical Garden Award (\$200)  
SEASIH Student Travel Award (\$50)  
SEASIH Ichthyology Award (\$100)  
SEASIH Herpetology Award (\$100)  
SAC/SWS Student Travel Award (\$100)



## ABSTRACT REQUIREMENTS

**Please follow the formatting instructions below and on the web when you submit your abstract. Please ONLY submit your abstract via the web site (<http://www.memphis.edu/asb>). If you do not follow the formatting instructions, your abstract will be returned to you for revision and will NOT be accepted after the deadline.**

Please submit your abstract to the web site. If you have trouble, please contact the Program Chair (Scott Franklin, [sfrankli@memphis.edu](mailto:sfrankli@memphis.edu)) or web editor (Steve Conlee, [sconlee@memphis.edu](mailto:sconlee@memphis.edu)). The web site will prompt you for author names and affiliations, as well as the title. You may develop your abstract in a word processing program, then paste into the web space. Single space all typing. Do not place hard returns at ends of lines – allow word-wrapping. The abstract must not exceed 250 words.

1. Prior to the meeting, the program will be posted on the meeting website <http://www.memphis.edu/asb>. You can check there to see the day and time of your presentation.
2. Reprints of abstracts are not available. You may duplicate the printed abstracts from *Southeastern Biology*.



## ASB 2004 FIELD TRIPS

### PRELIMINARY INFORMATION

Memphis welcomes the Association of Southeastern Biologists. We plan to provide the following field trips, but we are also currently working on additional trips. All trips leave from the Holiday Inn – UM Campus.

#### **FT1. Low-gradient river ecology**

This trip will be a canoe trip along the naturally meandering Wolf or Hatchie River. Participants will discuss floodplain ecology, in-channel dynamics, and enjoy some beautiful bottomland scenery. Jack Grubaugh (UM) will lead this trip.

#### **FT2. Mississippi Neotropical Migrants**

This trip will begin early in the morning and travel to Meeman-Shelby State Park. Participants will observe and discuss the ecology of neotropical birds and an ongoing study of Cerulean warblers. Paul Hamel (USFS) will lead this trip.

#### **FT3. Zoo Conservation**

This trip will go to the Memphis Zoo. Participants will discuss the roles of zoos in conservation, and specifically the role the Memphis Zoo providing for conservation throughout the world. Participants will get a behind-the-scenes tour of some of these efforts. Steve Reichling (Memphis Zoo) will lead this trip.

#### **FT4. The Ol' Man**

This trip will visit the Mississippi River and one of its islands using the research boat at the Meeman Biological Field Station. Participants will discuss the dynamics of large rivers, management of the lower Mississippi River corridor, and implications of this management on hydrology and fluvial processes. Thad Wasklewicz (UM) will lead this trip.



## PLENARY SPEAKER FOR THE 2004 MEETING

**DANIEL S. SIMBERLOFF**

**“Biological Invasions: A War We Can Win!”**



Photo by Nick Myers

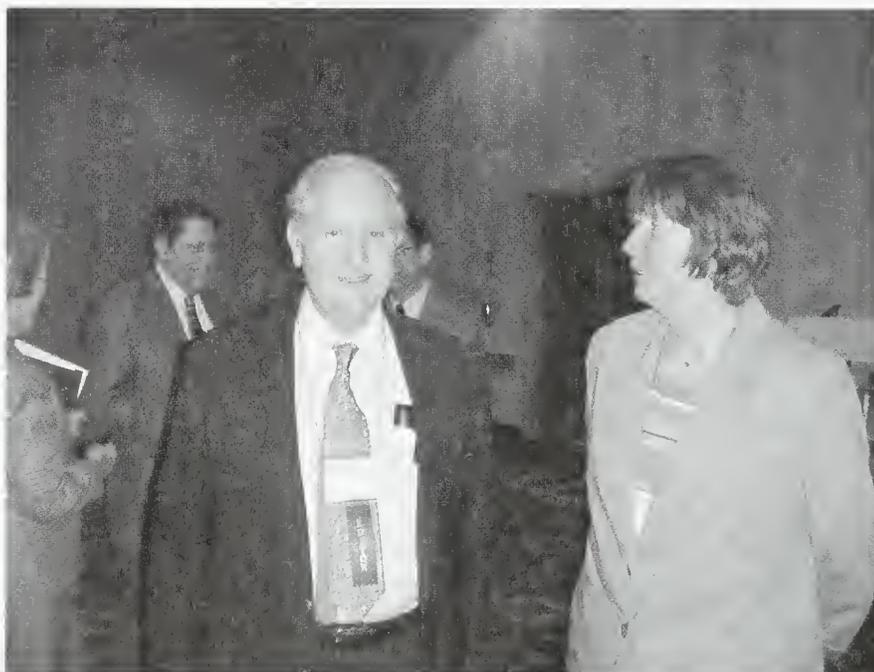
**Dr. Dan Simberloff** is the Nancy Gore Hunger Professor of Environmental Studies and Distinguished Scientist, Department of Ecology and Evolutionary Biology, and Director of the Institute for Biological Invasions at the University of Tennessee at Knoxville. Dr. Simberloff received his A.B. and Ph.D. from Harvard University, the latter as a student of E. O. Wilson. After 29 distinguished years teaching at Florida State, Dr. Simberloff moved to UT in 1997. His research interests include ecology, evolution, conservation biology, biogeography, and statistical ecology. His current main focus is invasion biology, particularly ecological and evolutionary changes in species introduced outside their geographic ranges, the impacts such species have on the communities they invade, and the means by which such invasions can be managed. His interests also include community composition and structure, especially patterns that reflect community morphological structure, i.e., the ways in which species vary morphologically depending on which other species are present.

Dr. Simberloff has produced more than 300 publications, including his most recent book, *Strangers in Paradise—Impact and Management of Nonindigenous Species in Florida* (D. Simberloff, D. Schmitz, and T. Brown, editors, Island Press, 1997) and a citation classic, D. Simberloff and E. O. Wilson, 1969, *Experimental zoogeography of islands: The colonization of empty islands*,

*Ecology* 50 (2): 278-296. He has served as editor and on editorial boards for many journals, currently *Biodiversity and Conservation*, *BioScience*, *Oecologia*, *Écologie*, and *Biological Invasions*. He is currently president of the American Society of Naturalists and a member of the U.S. National Science Board. Dr. Simberloff has been cited extensively by the popular press, including National Public Radio's "Living on Earth" and "NOVA."



Carolyn and Kenneth Shull.



Jim Caponetti (left) converses with Debbie Moore.

**Nomination for ASB Officers and Executive  
Committee Positions**

**DEADLINE: 17 OCTOBER 2003**

To members of the Nominating Committee: I wish to suggest that you consider the following ASB member(s) in selecting nominees for officers and executive committee positions. *(Please include the institutional address of each nominee.)*

PRESIDENT-ELECT \_\_\_\_\_

VICE-PRESIDENT \_\_\_\_\_

EXECUTIVE COMMITTEE *(two will be elected for three-year terms)*

**MAIL TO:** DR. ROBERT HAYNES, Department of Biological Sciences, University of Alabama, Tuscaloosa, AL 35487; tele. (205) 348-1826; FAX (205) 348-6460; rhaynes@bama.ua.edu.

NAME & ADDRESS OF NOMINATOR \_\_\_\_\_

## “TRAVEL” SUPPORT AWARDS FOR GRADUATE STUDENT MEMBERS OF ASB

**DEADLINE FOR POSTMARK: 16 JANUARY 2004**

Limited funds are available to partially defray the expenses of graduate students attending the Annual Meeting. **The awards are for lodging and meals only, including the ASB Banquet.** Departments are urged to provide transportation for their graduate students. *Recipients must be members of ASB.* The guidelines for application are as follows:

- (a) *The recipient is a current member of ASB.*
- (b) The recipient must be presenting a paper or poster at the Annual Meeting and must include a separate copy of the abstract of the paper or poster to be presented along with the application.
- (c) The recipient must be currently enrolled as a graduate student in the department where he/she conducted this research.
- (d) Student travel awards are granted on a competitive basis. Applicants must document expected expenses and list other sources of financial support for this meeting, including institutional aid, shared lodging and shared transportation.
- (e) In a paragraph, give a brief history of your education to date: indicated how many years you have been in graduate school and the expected date of completion of work for your degree, your major field of study and research, publications including those in press and in preparation, degree sought, name of major professor and any other pertinent details.
- (f) Give your source(s) of support while in graduate school: e.g. NSF, NIH, USDA, Teaching Asst., Research Asst., etc.
- (g) Include a letter of recommendation for an ASB support award from your faculty research advisor. This letter should comment on the work being presented and indicate the financial need of the student presenter. It should also indicate whether any departmental or other funding is available to the student.
- (h) Send application with supporting letter to: Dr. Zack Murrell, Department of Biology, Appalachian State University, Boone, NC 28608-2027; (828) 262-2683; FAX (828) 262-2127. In addition, e-mail a copy of your completed application documents without the supporting letter to: murrellze@appstate.edu.
- (i) Applicants will be notified of the decision of the Committee as soon as is practical. Recipients of the award will receive their checks at the meeting.

## GUIDELINES FOR POSTER PRESENTATIONS

Poster sessions have been incorporated as a regular means of scientific presentation at the annual ASB meetings. This type of presentation provides a more informal environment that encourages a direct interchange of ideas and discussion between presenter and audience. Poster presentations are open to all ASB members. Adherence to the following guidelines helps ensure the effectiveness of the poster presentation.

- (1) Display should fit on a 4' h x 8' w board suitable for thumbtacks or pushpins.
- (2) Poster must be displayed from 10 a.m. Thursday through 5 p.m. Friday or as otherwise determined by the Local Arrangements Committee. Authors will be required to be present at specified times during the Annual Meeting.
- (3) Poster should be carefully planned to maximize clarity and simplicity in conveying information.
- (4) Poster should have a heading, including a title, author, and author's institution(s). This heading should be placed at the top in letters no less than **3 cm** high.
- (5) The body of the poster, including text, figure legends, and table captions, should be in type no smaller than **18 pt (3-4 mm)** and *must* be legible from a distance of about 1-2 meters.
- (6) The body should be self-explanatory and should include figures, tables, graphs, maps, or photographs displayed in a well organized, coherent, and easy-to-follow sequence from top to bottom. Each illustration should contain a caption. *Do not overcrowd the display.*
- (7) A limited degree of text may be included, but care should be taken not to overwhelm the audience.
- (8) A large, abbreviated version of the abstract should be presented at the top of the poster, but below the heading. A clear listing of specific conclusions should appear at the bottom or end of the presentation.

Further inquiries may be directed to the Chair of the ASB Poster Award Committee: Dr. Rick Duffield, Department of Biology, Howard University, Washington, D.C. 20059; tele. (202) 806-6127; FAX (202) 806-4564; rduffield@howard.edu.



## RESEARCH AWARDS

### ASB SENIOR RESEARCH AWARD (\$600)

Given for an especially meritorious manuscript presented orally by the author(s) at the Annual Meeting of ASB. The presenter must be a member of ASB. In order to qualify for this award, the author(s) must have presented the work orally at any previous annual meeting or have submitted an abstract by the November abstract deadline for an oral presentation at the next annual meeting. The manuscript must either have been submitted for publication or be ready for submission and carry the format of the journal to which it will be (or has been) submitted. Author(s) must submit four copies of their manuscript and short biographical sketches of each author. Manuscripts received by 9 January 2004 will compete for the 2004 Senior Research Award. Manuscripts not received by this deadline (but submitted by 9 January 2005) will remain in competition for the 2005 Senior Research Award, subject to the following condition, which applies to ALL manuscripts eligible for this award: manuscripts may be in press, but not published prior to the last annual meeting. Judges will use a standard evaluation form that includes the following criteria: significance of ideas, soundness of hypotheses, originality (creativity), quality of methodology, validity of results, soundness of conclusions, clarity, completeness, organization, and contribution to the field. At the discretion of the Senior Research Award Committee, the award may be withheld or it may be split in case of a tie. *The recipient of the award must be present at the annual ASB banquet to receive the award.*

**Committee Chair:** Dr. Cliff R. Hupp, U.S. Geological Survey, 430 National Center, Reston, VA 20192; tele. (703) 648-5207; FAX (703) 648-5484; crhupp@usgs.gov.

### ASB STUDENT RESEARCH AWARD (\$1000)

Given for an especially meritorious manuscript presented orally by the author(s) at the Annual Meeting. In order to qualify for presenting the paper, the author(s) must submit an abstract by the November deadline. Papers submitted for the competition must be received in triplicate and in their entirety by the January deadline and must be journal-ready manuscripts worthy of publication. The student award (sponsored by Martin Microscope Company) is given to the senior author if she/he is a graduate or undergraduate student at the time of presentation. To qualify, author(s) must submit an abstract, title form, and application for the award by 14 November 2003, and four copies of the journal-ready manuscript with abstract, title form, and short biographical sketches of each author by 9 January 2004. Judges will use a standard evaluation form that includes the following criteria: significance of ideas, soundness of hypotheses, originality (creativity), quality of methodology, validity of results, soundness of conclusions, clarity, completeness, organization, and contribution to the field. At the discretion of the Student Research Award Committee, the award may be withheld or it may be split in the case of a tie. Papers may be in press, but not published prior to the previous annual meeting. Only members of ASB are

eligible and the recipient of the award must be present at the annual ASB banquet to receive the award.

**Committee Chair:** Dr. Larry J. Davenport, Department of Biology, Samford University, Birmingham, AL 53209; Tele. (205) 870-2584; FAX (205) 870-2479; [ljdavenp@samford.edu](mailto:ljdavenp@samford.edu).

### **ASB STUDENT RESEARCH AWARD IN AQUATIC BIOLOGY (\$200)**

The purpose of the award is to encourage excellence in aquatic biology research by undergraduate and graduate students. Students who are members of ASB and whose work is sponsored by a professional biologist who is also an ASB member are eligible. The paper must be based on research designed and completed by the student and it must be presented orally by the student as senior author at the Annual Meeting. To be eligible, author(s) must submit an abstract, title form, and application for the award by 14 November 2003, four copies of the journal-ready manuscript with abstract, title form, and short biographical sketches of each author by 9 January 2004 and a letter from the sponsor affirming student status at the time the research was completed and sponsorship of the student to the chair of the Student Research Award Committee. Judges will use a standard evaluation form that includes the following criteria: significance of ideas, soundness of hypotheses, originality (creativity), quality of methodology, validity of results, soundness of conclusions, clarity, completeness, organization, and contribution to the field. At the discretion of the Student Research Award Committee, the award may be withheld or it may be split in the case of a tie. It is intended that aquatic biology be broadly interpreted. For example, research projects on aquatic organisms, wetland biota, and water quality are all eligible. The recipient of the award must be present at the Annual ASB Banquet to receive the award.

**Committee Chair:** Dr. Larry J. Davenport, Department of Biology, Samford University, Birmingham, AL 53209; Tele. (205) 870-2584; FAX (205) 870-2479; [ljdavenp@samford.edu](mailto:ljdavenp@samford.edu).

### **ASB STUDENT POSTER AWARD (\$300)**

Given for an especially meritorious poster presentation by the author(s) at the Annual Meeting. The purpose of the award is to stimulate greater student participation at the Annual Meeting. In order to qualify for this award, the senior author must be a student, and must submit an abstract by the deadline 14 November 2003. Student poster presentations must adhere to the "Guidelines for Poster Presentations." Only student authors who request consideration for the poster award on the abstract submission form will be judged for the award. The student poster award is given to the senior author if she/he is a graduate or undergraduate student at the time of presentation. Only members of ASB are eligible and the recipient of the award must be present at the Annual ASB Banquet to receive the award. In addition to adherence to the "Guidelines for Poster Presentations," student poster presentations will also be judged using the following specific criteria:

- (1) Overall aesthetics and attractiveness of presentation
- (2) Ease of reading from a distance (1-2 meters)
- (3) Clear and concise organization
- (4) Clearly stated hypothesis
- (5) Soundness of methods for testing hypothesis
- (6) How well conclusions are supported by results

At the discretion of the ASB Poster Award Committee, the award may be withheld or it may be split in the case of a tie. Further inquiries may be directed to the chair of the ASB Poster Award Committee.

**Committee Chair:** Dr. Rick Duffield, Department of Biology, Howard University, Washington, D.C. 20059; tele. (202) 806-6127; FAX (202) 806-4564; rduffield@howard.edu.

### **EUGENE P. ODUM AWARD (\$500)**

Given by the Southeastern Chapter of the Ecological Society of America for the best ecological paper presented by a student. Undergraduate and graduate students are eligible, and the student must be the sole or senior author. The paper must deal with a clearly ecological topic and should represent substantially completed work. It should be presented in one of the following sections: Aquatic Ecology, Plant Ecology, or Animal Ecology. One copy of the title and abstract should be sent to the ASB Program Chair by November 14, 2003, and a second copy must be sent by the same date to the Odum Committee Chair.

**Committee Chair:** Dr. James S. Fralish, Department of Forestry, Mail Code 4411, Southern Illinois University, Carbondale, IL 62901; Tele. (618) 521-8006; FAX (618) 549-6318; jfralish@gte.net.

### **THE NORTH CAROLINA BOTANICAL GARDEN AWARD (\$200)**

Given by NCBG (through the Southeastern Section of the Botanical Society of America and the Southern Appalachian Botanical Society). This is awarded for a paper presented at the annual ASB meetings that best advances our understanding of the biology and conservation of the southeastern plants and thus contributes to the mission of the North Carolina Botanical Garden. Of special interest to the Garden are the rare plant species of the Southeast: why they are rare; how they interact with plants, animals, and their environment; and what can be done to ensure their survival. The paper may deal with a broad area including systematics, ecology and conservation. All individuals who are eligible to present at the ASB meetings are eligible for this award. They may be students, faculty or others.

**Awards Committee Chair:** Dr. John Randall, Department of Biology, University of North Carolina, Greensboro, NC 27412, (919) 962-0522, FAX (919) 962-3531, jrandall@email.unc.edu.

**TRAVEL SUPPORT AWARDS FOR STUDENT MEMBERS OF THE  
SOUTHEASTERN DIVISION, AMERICAN SOCIETY OF  
ICHTHYOLOGISTS AND HERPETOLOGISTS**

Travel grants of \$50 each are available to a limited number of student members of SEASIH to attend the ASB annual meeting on 14-17 April 2004. Applicants must be presenting a paper or poster at the meeting. Students seeking travel awards should provide a brief justification for their request and an abstract of their paper/poster by 16 January 2004. Recipients must be present at the SEASIH business meeting to pick up their award.

**SOUTHEASTERN DIVISION, AMERICAN SOCIETY OF ICHTHYOLOGISTS AND  
HERPETOLOGISTS OUTSTANDING STUDENT PAPER AWARDS  
ICHTHYOLOGY (\$100); HERPETOLOGY (\$100)**

Students who are sole or senior authors on papers, and who are members of SEASIH may compete for this award in one of these two subject areas. To be considered, submit a copy of the abstract that was submitted to ASB to the SEASIH president at the address below by 16 January 2004. Send applications for both awards to: Dr. Martin O'Connell, Department of Biological Sciences, University of New Orleans, New Orleans, LA 70148; tele. (504) 280-1055; FAX (504) 280-6121; moconnel@uno.edu.

**SOCIETY OF WETLAND SCIENTISTS  
SOUTH ATLANTIC CHAPTER  
STUDENT TRAVEL AWARD**

The South Atlantic Chapter of the Society of Wetland Scientists (SWS) will again offer its student travel award to support students presenting wetland research at the ASB annual meeting. We will award at least \$100 to a maximum of five students. The Chapter's Awards and Executive Committees will judge the applicants based on the scientific quality and importance of their research as described in the abstract. All students presenting research on a wetland topic are eligible; membership in SWS is not required. Please check the appropriate box on the ASB registration form and submit the abstract as instructed in the ASB call for papers. Further, applicants must also submit their abstract, by electronic mail, to Cliff R. Hupp at crhupp@usgs.gov. Award winners will be invited to the Chapter's luncheon meeting (no charge for awardees) held during the ASB annual meeting.

## AWARDS FROM THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

### **Robert H. Gibbs, Jr. Memorial Award for Excellence in Systematic Ichthyology**

Nominations are solicited for the Robert H. Gibbs, Jr. Memorial Award for Excellence in Systematic Ichthyology from the American Society of Ichthyologists and Herpetologists (ASIH). The prize is awarded for "an outstanding body of published work in systematic ichthyology" to a citizen of a Western Hemisphere nation who has not been a recipient of the award. The award is offered annually and consists of a plaque and a cash award (approximately \$5,000). The award is presented during the banquet held in conjunction with the annual meeting of ASIH. Nominations may be made by any ichthyologist, including self-nominations, and should include the nominee's curriculum vitae, details of the nominee's specific contributions and their impacts on systematic ichthyology. Nomination should be submitted by March 1, 2003 for the nominee to be eligible for that year's award. Nominations will be effective for three years. Four copies of each nomination should be sent to Chair of the 2003 Gibbs Award Committee or ASIH Secretary.

**Committee Chair:** Dr. William D. Anderson, Jr., Grice Marine Biological Laboratory, College of Charleston, 205 Fort Johnson, Charleston, SC 29412-9110, e-mail: andersonwd@cofc.edu.

**ASIH Secretary:** Dr. Maureen A. Donnelly, Department of Biological Sciences, Florida International University, 11200 SW 8th St., University Park, Miami, FL, 33199, e-mail: asih@fiu.edu.

### **Henry S. Fitch Award for Excellence in Herpetology**

The Henry S. Fitch Award honors the herpetological spirit of Henry S. Fitch, a distinguished member of the University of Kansas faculty, for his manifold contributions to our understanding of the systematics, ecology, natural history and conservation of amphibians and reptiles. The award is made by the American Society of Ichthyologists and Herpetologists (ASIH) to an individual for long term excellence in the study of amphibian and/or reptile biology, based principally on the quality of the awardee's research, with consideration given to educational and service impacts of the individual's career in the field of herpetology. The award is presented at the banquet held in conjunction with the annual meeting of ASIH and includes a cash prize and a commemorative certificate. The award for 2002 was made to Robert F. Inger, Field Museum of Natural History, for his original and insightful studies on the systematics, ecology and biogeography of the amphibians and reptiles of tropical Africa and Southeast Asia.

Nominations for the 2003 Fitch Award may be made by any herpetologist, including self nominations, and should include a letter of nomination detailing the nominee's specific contributions and their impact on the field of herpetology, a curriculum vitae and any additional supporting materials. All nominations are effective for three years. Nominations must be received by February 15, 2003 for

the nominee to be eligible for the 2003 award. Four copies of the nomination materials should be sent to the chair of the Fitch Award Committee.

**Committee Chair:** Jay M. Savage, Rana Dorada Enterprises, S.A., 3401 Adams Avenue, Suite A, San Diego, CA 92116-2490. Please no e-mail or FAX nominations.

### **Raney Fund Award**

The Raney Award is presented annually in honor of Edward C. Raney (1909-1984). Raney was a leader among Ichthyologists. He possessed a broad knowledge of the fishes of the world, and his particular area of expertise was the fishes of the eastern United States. A member of the faculty at Cornell University, Dr. Raney authored over 75 papers dealing with the systematics, behavior, and ecology of fishes. He was an expert on aquatic environmental problems and served on numerous environmental advisory committees. He was a member of over 30 professional societies, and he served as secretary (1948-1951) and president (1955-1956) of ASIH. The students of Ed Raney are among the leaders in ichthyology today in no small part because of his mentorship and enthusiasm in the study of fishes. Applications are solicited for grants to be awarded from the Raney Fund for Ichthyology. These funds are used to provide support for young ichthyologists for museums or laboratory study, travel, fieldwork, or any other activity that will effectively enhance their professional careers and their contributions to the science of ichthyology. Applicant should be members of ASIH and should be enrolled for an advanced degree. Applicants who do not meet these basic requirements may be considered for the award under exceptional circumstances if their careers are judged to be in a developmental stage. Individual awards are typically in the \$400-\$1000 range and will be awarded on basis of both merit and need. Applications for the Raney Award and a letter of recommendation should be sent to **Dr. John Friel**, Cornell University, Department of Ecology & Evolutionary Biology, Corson Hall, Ithaca, NY 14853-2701, e-mail: [jpf19@cornell.edu](mailto:jpf19@cornell.edu). Consult Dr. Friel for application details.

### **Gaige Fund Award**

The Gaige Award is presented annually in honor of Frederick (Dick) and Helen Gaige, both of whom lived during the years 1890-1976. Dick Gaige, an entomologist, was also an avid herpetological collector and was director of the Museum of Zoology at the University of Michigan from 1928-1945. Helen Gaige was a herpetologist with an interest in neotropical frogs. She served as herpetological editor of *Copeia* from 1930-1937 and as editor in chief from 1937-1950. This unsurpassed editorial service earned Helen the title of Honorary ASIH President for Herpetology in 1946. The Gaiges showed a lively interest and encouragement toward their colleagues and students and, through their helpfulness to others, were a major influence in biology in this country and on herpetology in particular. Applications are solicited for grants to be awarded from the Gaige Fund. These funds are used to provide support to young herpetologists for museum or laboratory study, travel, fieldwork, or any other activity that will effectively enhance their professional careers and their contributions to the science of herpetology. Applications must be members of ASIH and should be enrolled for an advanced degree. Individual award are

typically in the range of \$400-1,000, and will be awarded on the basis of both merit and need. Applications for the Gaige Award and letters of recommendation should be sent to the Gaige Award Chairperson.

**Committee Chair:** Maureen Kearney, Department of Zoology, Field Museum of Natural History, 1400 S. Lakeshore Drive, Chicago, IL 60605, email: mkearney@fieldmuseum.org. Consult Dr. Kearney for application details.

### **Stoye Awards**

Stoye Awards of the American Society of Ichthyologists and Herpetologists recognize the best student oral presentations in the following categories:

1. **General Ichthyology** includes, but is not limited to, morphological and molecular systematics, techniques in systematics, zoogeography, paleontology and faunal descriptions.
2. **General Herpetology** includes, but is not limited to, morphological and molecular systematics, techniques in systematics, zoogeography, paleontology and faunal descriptions.
3. **Genetics, Development and Morphology (GD&M)** includes, but is not limited to, population genetics, mitochondrial DNA analysis, comparative embryology, heterochrony, descriptive and experimental development, comparative and evolutionary morphology, functional morphology and biomechanics.
4. **Ecology and Ethology (E&E)** includes, but is not limited to, population and community ecology, life history strategies, descriptive and experimental ethology, behavioral ecology, neuroethology and ecomorphology.
5. **Physiology and Physiological Ecology (P&PE)** includes, but is not limited to, comparative and experimental physiology, biochemistry, sensory and behavioral physiology and endocrinology.

### **Storer Awards**

Storer Awards of the American Society of Ichthyologists and Herpetologists recognize the best student poster presentations in two categories: 1) Ichthyology and 2) Herpetology.

### **Eligibility and Judging**

To be eligible for either **Stoye** or **Storer Awards**, a student must (1) be the sole author and presenter, (2) be a member of ASIH, (3) indicate a desire to be considered when submitting an abstract (see "Submitting Abstracts") and (4) meet the ASIH criteria for "student": "an individual who at the time the paper is given ... is the equivalent of a full-time student (... an individual who is devoting their major efforts to a formal program of studies) or who has satisfactorily completed a thesis or dissertation defense during the previous 12 months." Stoye and Storer presentations are judged by the following criteria: introduction; methods; data analysis and interpretation; conclusions - innovation, originality and scientific significance; presentation; and visual aids or graphic design. The rating scale is 0-10 points: excellent (9-10), very good (7-8), good (4-6), fair (2-3), poor (0-1).

## Honor Thy Teacher!

### ASB MERITORIOUS TEACHING AWARD

**DEADLINE JANUARY 16, 2004**

Each year the ASB recognizes one of its members for especially meritorious teaching. Carolina Biological Supply Company, Burlington, NC, has generously sponsored this \$1500 award, which will be presented together with an appropriate citation at the Annual Banquet in Memphis, Tennessee, in April 2004.

The Meritorious Teaching Award Committee may each year select for the award a member of the association who has taught biology for at least ten years in any college or university represented in the association. There are no restrictions on size of the institution, presence of graduate program, etc. The Award simply is for highly effective teaching. There are many deserving members of ASB. However, they cannot nominate themselves, so former students or colleagues must take an active role in assembling the materials that the Committee then will evaluate.

Take the lead, pass the word—serve as the coordinator and nominate a deserving teacher! Solicit supporting letters from the nominee's present and former students. Contact his or her colleagues for additional endorsements. Be sure to include any form of recognition by the nominee's home institution of excellence in teaching, or special assignments or mentoring roles facilitating good teaching. Of special note would be the number and quality of students for whom the nominee provided primary inspiration to continue in biology, especially for students who subsequently earned advanced degrees. In short, document the educational impact this individual has made by virtue of his or her role as a biology professor.

Nominators should send a current *curriculum vitae* and all relevant documents, together with the Nomination Form for the Meritorious Teaching Award, to: Dr. Thomas R. Wentworth, Department of Botany, 4206 Gardner Hall, Campus Box 7612, North Carolina State University, Raleigh, NC 27695; tele. (919) 515-2168; tom\_wentworth@ncsu.edu. Submit all materials in triplicate by the January 16 due date. If you have any questions, please call me or send e-mail. Previously nominated candidates who did not receive the award may be re-nominated, with updated supporting materials. The Committee would welcome the task of deciding among several candidates.

Thanks for taking this initiative.

Dr. Thomas R. Wentworth, Chair  
Meritorious Teaching Award Committee



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*NOMINATION-ASB MERITORIOUS TEACHING AWARD, 2004*

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NAME:

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ADDRESS:

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TEACHING INTEREST:

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NOMINATOR NAME/ADDRESS:

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SUPPORTING DOCUMENTATION: Letter of nomination \_\_\_\_\_

(enclosed, in triplicate \_\_\_\_\_)      Supporting letters \_\_\_\_\_

*Curriculum Vitae* \_\_\_\_\_      Additional Information (list) \_\_\_\_\_



### ASB ENRICHMENT FUND AWARD

ASB maintains an enrichment fund to support long- and short-range objectives to advance biological education through teaching and research. The Enrichment Fund Board is chaired by Kim Marie Tolson. As has been the custom for the past several meetings, ASB recognizes individuals for their achievements and dedication to biology education at the secondary school level. The awardee is invited to attend the annual meeting and be honored. Expenses for attendance at the meeting are defrayed by the Enrichment Fund. The use of money from this fund shows appreciation for excellence in teaching at the secondary level, and to reach out to our colleagues in the teaching profession. Contributions to the fund can be made at the annual meeting or can be sent to the Treasurer of ASB whose address can be found in the inside front cover of this issue.

## INFORMATION ON A NEW COMPANY BIOMIMETRY CONNECTIONS

A new company is being established based on the role of 'biomimetry' (drawing innovations from nature) to create new products and processes. We are currently seeking to establish an 'expertise registry of biologists' that can be linked, as needed, to a project-based commercial network (robotics, biomedical, aerospace, textile, opto-electronic, neural network developers, etc.) that we are presently developing. There has been a rising interest across industry at large to begin to explore all species for their full engineering/design/material/function values. New imaging and computational analysis capabilities are driving much of this. We believe that with a species-expertise registry in place and engaged by a company serving a management/product-development accelerator function, corporations will also be increasingly interested in contributing to programs supporting species conservation efforts.

We would very much welcome hearing from biologists who are potentially interested in participating with industry partners in this new biomimetry initiative.

Respectfully, John Pietrzyk  
Biomimetry Connections // Mining the 'Smart' in Evolution  
5066 Anaheim Loop, Union City, CA 94587-5523  
Tel: 510-489-2440; Email: [jppietrzyk@sbcglobal.net](mailto:jppietrzyk@sbcglobal.net)



## 1<sup>ST</sup> ANNUAL SOUTHEASTERN ECOLOGY AND EVOLUTION CONFERENCE (SEEC)

The School of Biology at the Georgia Institute of Technology invites graduate, undergraduate, and postdoctoral scientists in ecology, evolution, environmental sciences, and other related fields to submit abstracts for either oral or poster presentations for the first Annual Southeastern Ecology and Evolution Conference (SEEC), March 5-7, 2004, Atlanta, Georgia, USA. To enhance participation, registration is FREE and can be completed at: <http://www.prism.gatech.edu/~aw181/SEEC/Registration.htm>, before the January 31, 2004, deadline. Visit <http://www.biology.gatech.edu/SEEC/SEEC.html> for more information, or e-mail Alan Wilson at [alan.wilson@biology.gatech.edu](mailto:alan.wilson@biology.gatech.edu).



## MEMBER FOR MANY YEARS

Laura M. Doyle

The Treasurer reported to the Print Editor recently that Laura M. Doyle wished to terminate her membership because she is past 90 years old and cannot get out much anymore. The Treasurer thanked Laura Doyle for her faithful support of over 50 years and entered her name in our database as a life member. The Print Editor wrote to Laura Doyle requesting a short autobiography and she sent the following:

Autobiography: Laura M. Doyle

Joined the Association of Southeastern Biologist while teaching at Florida State University in 1951. Returned to California and continued research work at Stanford. Married Morris Doyle in 1961 and continued to teach and counsel at a local high school where 85 percent of the students went to college. I'm also a member of the California Academy of Science, American Entomology Society and Audubon Society. Retired in 1975 and have traveled over much of the world with science-oriented groups.



## DECEASED MEMBERS

It has been reported to the Print Editor that the following two members passed away during the year:

*Dr. Catherine Keever*  
*Dr. Dekalb Russell*

The Print Editor would appreciate receiving an obituary by e-mail with an electronic image of these two deceased members from anyone who knows them. Contact information for the Print Editor is located in the inside front cover.



Lafayette Frederick addresses the audience at the annual business meeting.

## REVIEW

James Ross, *Review Editor*  
7196 College Station Dr., Cumberland College  
Williamsburg, KY 40769-1382

Collette, B. B. and G. Klein-MacPhee. 2002 (eds.). Bigelow and Schroeder's, **Fishes of the Gulf of Maine**, 3<sup>rd</sup> ed. Smithsonian Institution Press, Washington, DC. 748 pages. \$75.00.

Fishes of the Gulf of Maine is an update of two previous editions: the first by Bigelow and Welsh (1925) treating 83 families, 178 species of fishes in 567 pages, the second, the classic, by Bigelow and Schroeder (1953) that dealt with 108 families, 219 species in 577 pages. This third edition treats 118 families, 252 species of fishes known from the Gulf in 798 pages. The Gulf of Maine is that area bounded by the oceanic bight of Nantucket Shoals and Cape Cod, in the southwest, to Cape Sable on the northeast; its seaward edge is bound by Nantucket Shoals, Georges Bank, and Brown Bank out to the 300 m (150 fathom) depth contour.

Unlike most edited volumes, Collette and Klein-MacPhee personally treat 46% of the family-species accounts contained in the volume while 38 other scientists cover the remaining families. Each species or family treatment has also been reviewed by outside scientists to insure completeness and accuracy of each account.

This third edition is based on 30 years of trawl surveys 1968-1996, mostly conducted by the Northeast Fisheries Marine Center, Woods Hole, Massachusetts. It also has relied on the 180 years of food studies (31,567 specimens) trawled or longlined between 1977-1980 and summarized by Bowman et al. (2000) and the 81 fish egg and larval MARMAP surveys of 1977-1987. As a result 63 name changes or updates (25%), of those used today, are different from those found in Bigelow and Schroeder's 1953 edition. Drawings, mostly from the original Bigelow and Schroeder edition, depict 244 of the 252 species discussed in the volume. Comments about each species treat: description, color, meristics, size, distribution, food, predators, parasites, reproduction, fecundity, early life history, eggs and larvae, age, growth, general range, occurrences in the Gulf of Maine, importance, and commercial fishery. Thus, 10 fish families dominate the 252 species found in the Gulf: Carangids (jacks, 11 species), Gadidae (cods, 10), Scombridae (mackerels, 10), Ragidae (skates, 8), Clupeidae (herrings, 8), Pleuronectidae (righteye flounders, 7), Squalidae (dogfish sharks 6), Myctophidae (lanternfishes, 6), Cottidae (sculpins, 6), and Carcharhinidae (requiem sharks, 5). These, in turn, can be characterized as: resident shallow-water species (55), deepwater (23), pelagic (9), and visitors (92). Few major changes are: *Polyprion americanus* is now placed in the family Polyprionidae (not Percichthyidae, as noted in the American Fisheries Society common names list, Robins et al. (1991) and temperate basses (*Morone* sp.), Percichthyidae in Bigelow and Schroeder (1953) are now in the family Moronidae (Percichthyidae are now considered to include only South American and Australian freshwater species). The pelagic stingray is treated as *Dasyatis*

*violacea* instead of *Pteroplatytrygon violacea* (McEachran and Fechhelm 1998). Some species treatments seem to ignore recent new geographic occurrences: *Echinorhinus* is known from North Carolina and Georgia; *Dalatias licha* occurs in South Carolina: cownose rays (*Rhinoptera bonasus*, schools of 500,000 have been recorded, Schwartz 1993), and ladyfish, *Elops saurus*, are abundant, not rare, in North Carolina (Schwartz 2002). Why are only hybrids of menhaden (*Brevoortia*) and striped bass (*Morone*) mentioned and not of trouts and salmon? Little is mentioned of the recent surge in hybridization culture and stocking of especially striped bass to increase their availability to sport and commercial fishermen.

Neither the white-tip nor *Carcharhinus floridanus* on p. 409 is correct. The true white-tip is the oceanic white-tip, not recorded in Gulf of Maine. *C. floridanus* is now considered to be the silky shark, *C. falciformis*.

Thirty-nine distribution maps depict the sampling thoroughness of the Gulf of Maine and the distribution of several important species found in the Gulf. A vast scientific Literature Cited section contains references, mostly recent, from 1789-2001, pages 631-737. A general common names index, but no subject index, rounds out the volume. The author-editors are commended in carrying on the excellence, set by Bigelow and Schroeder's 1953 *Fishes of the Gulf of Maine*, in producing this 3<sup>rd</sup> edition update. Like the former, many will reach for and use it for many years.

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- Bigelow, H. B. and W. Welsh. 1925. *Fishes of the Gulf of Maine*. Bull. U.S. Bur. Fish. 40(1):1-567.
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FRANK J. SCHWARTZ, *Institute of Marine Sciences, University of North Carolina, Morehead City, NC 28557-3209.*

## NEWS OF BIOLOGY IN THE SOUTHEAST

Jon R. Fortman—News Editor  
Division of Science and Math  
Mississippi University for Women  
Columbus, MS 39701

### ABOUT PEOPLE AND PLACES

#### GEORGIA

Oxford College, Emory University, Biology Department. Dr. Nitya Jacob joined the faculty in August 2002. Dr. Jacob is a graduate of Agnes Scott College and received her Ph.D. from The Ohio State University, Department of Horticulture and Crop Science. Her research interests focus on gene regulation and expression in tobacco plants. She is teaching Genetics, Introductory Biology and Anatomy and Physiology.

#### TENNESSEE

The University of Tennessee, Knoxville, Department of Botany. Dr. B. Eugene Wofford, Director of the University of Tennessee Herbarium, is the recipient of the Tennessee Department of Environment and Conservation's 2003 Higher Education Award for External Achievement. The award is judged upon environmental and conservation stewardship activities across Tennessee.

#### VIRGINIA

Mary Washington College, Department of Biological Sciences. Three Mary Washington College biology students received undergraduate research awards on October 20, 2002, from the Virginia Academy of Science. They comprised two of the five award winners who each walked away with a \$500 research grant. The event was held at the Science Museum of Richmond. At the competition, 19 posters on undergraduate research were presented by college students throughout the state. Senior Laura Williams of Richmond, and junior Emily Dilger of Setauket, NY, both biology majors under the direction of Dr. Andrew Dolby and Dr. John Temple, won for their poster "Nocturnal Thermoregulation in the White-throated Sparrow (*Zonotrichia albicollis*). Hossein Hamed, a senior biology major from McLean directed by Dr. David Jarrell, won for his poster "Phalaenopsis Molecular Systematics: The Study of Plant Evolution Using DNA Sequence." Dr. Werner Wieland was appointed Editor of the Virginia Journal of Science. VJS is a quarterly publication of the Virginia Academy of Science with circulation in 47 states and 50 countries overseas; Volume I, Issue 1...January 1940 (Succeeds Claytonia, 1934-39).

#### Deadlines for the submission of "news."

January issue: October 28.  
April issue: January 13.

September issue: July 13.  
December issue will not contain "news."

Presentations at the Forty-Sixth Annual Meeting of the Southeastern Region of Beta Beta Beta in Association with the Sixty-Fourth Annual Meeting of the Association of Southeastern Biologists, Arlington, Virginia.

**ABSTRACTS  
DISTRICT I  
PAPER SESSION**

GALLAGHER, HEATHER E. AND JANICE A. DYE. Beta Alpha, Salem College and USEPA, RTP, NC--Airway epithelial effects of particulate pollutants: Role of metal interactions.

Numerous epidemiologic studies have demonstrated positive associations with particulate matter (PM) air pollution and daily respiratory morbidity--including exacerbations of asthma. Data are needed to elucidate which PM subcomponents may be mediating disease exacerbation in individuals with inflammatory airways disease. To this end, rat tracheal epithelial (RTE) cell cultures were used to assess the degree of epithelial injury induced by exposure to certain PM-associated transition metals, both alone and in combination. Metal sulfate solutions were administered in single and combination exposures on both immature and mature RTE cell cultures. Data indicated that combined metal exposures resulted in significantly greater epithelial injury than exposure of any single metal. This study provides preliminary data important to investigate PM-associated transition metal effects in RTE cell cultures and indicates that metal interactions appear to play a significant role in the airway epithelial injury induced by exposure to certain PM-associated transition metals. (This abstract does not reflect USEPA policy.)

GRAVINESE, PHILIP M. Sigma Psi, Florida Institute of Technology--Delayed metamorphosis in blue crab *Callinectes sapidus* megalopae: Are there costs?

Postlarvae (megalopae) of the blue crab *Callinectes sapidus* are transported from coastal areas to estuaries where they metamorphose to benthic juveniles. Metamorphosis is accelerated by exposure to chemicals in estuarine water and from vegetation associated with nursery habitats. The ability to postpone metamorphosis is advantageous because it increases the likelihood of finding suitable settlement habitat and avoiding sites where survival may be poor. However, extending the megalopal stage may be energetically costly, thus reducing the fitness of post-settlement stages. To test the hypotheses that delayed metamorphosis in *C. sapidus* megalopae results in lower post-settlement survival and growth, metamorphosis in field-caught megalopae was either accelerated or postponed by exposure to water with or without estuarine chemical cues. Crabs were monitored daily and their growth rate and survivorship recorded for the first five instars (J1-J5). Although delayed metamorphosis had little effect on the size of early instars, growth rates were significantly higher in J3 and J5 crabs in the nondelayed control. Metamorphosis of megalopae was accelerated by estuarine cues, yet there was no effect on molt

stage duration or survival. These results indicate that the costs of deferred metamorphosis on juvenile growth may offset the advantages of prolonging habitat selection.

GRAY, SARAH. Sigma Tau, Florida State University--Nutrient limitation in the inquiline community of the pitcher plant, *Sarracenia purpurea*.

Species abundance and occurrence in aquatic communities can be greatly affected by the availability of one or a small number of limiting nutrients at the basal trophic levels. Limiting resources were investigated in the invertebrate community that is found in the water-filled leaves of the pitcher plant, *Sarracenia purpurea*, in natural populations in the Apalachicola National Forest. A press experiment was conducted over seven days in which simple forms of carbon, nitrogen, and phosphorus were added individually and in all combinations to individual leaves to study the nutrient-availability forces that take place within this food web. To investigate predator-control forces and the interaction between nutrient-availability and predator-control forces, the design was repeated with and without a top-predator, mosquito larvae, present. The bacterial, protozoan, and rotifer species richness and abundance were determined throughout the seven days. Orthophosphate, nitrate, and ammonium concentrations were also calculated. Bacterial abundance and species richness were significantly increased by the addition of carbon, but were relatively unaffected by other treatments. Protozoa and rotifer abundance was reduced by their predator, mosquito larvae, but was generally unaffected by nutrients. Overall, it appears that while direct trophic effects are strong, indirect effects across trophic levels are generally minimal.

KIRPALANI, NEETA N. Beta Rho, Wake Forest University--Phosphorylation signaling and the regulation of auxin transport in *Arabidopsis thaliana* roots and hypocotyls.

Redistribution of auxin contributes to gravitropic bending of plant tissue; however, the mechanisms by which gravitropic signaling leads to altered auxin transport are not fully understood. Protein phosphorylation and dephosphorylation have been implicated in this regulation by studies of the roots curl in NPA1 (*rcn1*) mutant, which has a mutation in a gene that encodes a protein phosphatase 2A regulatory subunit. Roots of *rcn1* respond more slowly to gravity stimulation than wild-type (Ws) roots. In hypocotyls of *rcn1* mutants transformed with the DR5- $\beta$ -glucuronidase (GUS) reporter gene, auxin induced gene expression was localized to the lower side of the hypocotyl where gravitropic bending occurs. In order to identify a kinase that may also function in regulating auxin transport, plants with mutations in the PINOID (PID) gene, which encodes a serine-threonine protein kinase were examined. Roots of the *pid-9* mutant have a slower response to gravity stimulation compared to wild-type (Columbia). Furthermore, basipetal IAA transport was measured in *pid-9* roots since a correlation has been suggested between basipetal auxin transport and gravity response. The gravitropic response alterations in the *pid-9* and *rcn1* mutants indicate that phosphorylation signaling plays an important role in regulation of auxin transport in *Arabidopsis* roots and hypocotyls.

LE BLEU, VALERIE. Sigma Psi, Florida Institute of Technology--Cell culture in a rotating bioreactor: Impact of gravity on the cell cycle of mouse leukemic lymphocytes.

Some of the most intriguing questions raised by space flights concern the impacts of changes in gravity on cellular processes, cell functions, and the cell cycle. Previous space flight and ground experiments demonstrated an impact of reduced gravity, called microgravity, on the proliferation and disease-responsiveness of lymphocytes. In ground experiments, bioreactors that rotate continuously about the horizontal axis have been used to simulate microgravity by averaging the gravitational vector, and results from those experiments suggest that simulated microgravity also influences the locomotion, proliferation and activation of lymphocytes. In the rotating bioreactor, mouse lymphocytic L1210 cells were attached and grown on a porous surface, so that at each division one newborn cell was released and collected. The collected newborn cells progressed synchronously through the cell cycle. Cell size and DNA distributions of the synchronous cells were investigated after various times of rotation by electronic particle sizing and flow cytometry. The results suggest that the cell cycle of L1210 cells was slowed by averaging the gravity vector, particularly in the S phase. This newly developed bioreactor is an excellent model system for investigating the impacts of gravity and gravity averaging on the cell cycle and the resultant effects on lymphocyte function.

LOPEZ-DUARTE, PAOLA C. Sigma Psi, Florida Institute of Technology--Circatidal swimming behavior of brachyuran crab zoea larvae: Implications for ebb-tide transport.

Previous studies have shown that the larvae of some brachyuran crabs use selective tidal-stream transport (STST) to migrate from estuaries to coastal areas to undergo development. The STST behavior of newly hatched larvae is characterized by upward vertical migration during ebb tide followed by a descent during flood tide. The objective of the study was to determine if zoeae of the fiddler crab *Uca pugilator* and the blue crab *Callinectes sapidus* possess endogenous rhythms in vertical migration that could underlie STST and promote offshore transport. The swimming activity of newly hatched zoeae was monitored under constant darkness for 72 h. *Uca pugilator* zoeae displayed a circatidal rhythm in swimming, with peaks in activity occurring near the expected times of ebb currents. Conversely, *C. sapidus* zoeae exhibited no clear rhythmic migration patterns. These results are consistent with predictions based on species-specific differences in spawning and the location of hatching areas. *Uca pugilator* larvae are released within estuaries near the adult habitat. Thus, utilization of STST by zoeae is adaptive since it enhances export. Vertical migratory behavior may not be necessary for *C. sapidus* larvae to reach coastal waters since ovigerous females migrate seaward prior to spawning and hatching occurs near inlets.

MUELLER, BRANDI. Sigma Nu, University of Tampa--Health quality of *Halodule wrightii* seagrass growing near marinas.

Researchers are just beginning to discover how important seagrasses are to coastal biomes. Unfortunately seagrasses are being eliminated because of human manipulations. Three locations of seagrasses in Tampa bay were studied: grasses next to Tampa Bayside Marine, grasses outside the marina, and a control group from Ft. Desoto. It is hypothesized that the seagrasses next to the marina will be less healthy than those that are not disrupted by boats and possibly gasoline in the water. Water tests were conducted to determine that there were no gasoline compounds in the water. Grass density was determined at all three sites, and showed that the seagrass was significantly denser at Fort Desoto than the other two sites. Grass samples from each site were taken and dissolved in Dimethylformamide to determine photosynthetic qualities. From spectrophotometer readings at 480, 510, 646, and 664nm the total chlorophyll a, b, and carotinoids were determined. All tests supported the hypothesis that the grass beds were healthier away from the marina, except carotinoids, which showed no significant difference in health of the seagrasses. This research is the first step to a project monitoring the health of *Halodule wrightii* at Tampa Bayside Marina that is being transplanted.

PARKER, MEREDITH. Tau Xi, Meredith College--*In vitro* cardiac functional and cytotoxic effects of combustion source particle bioavailable constituents.

Several epidemiological studies indicate significant associations between particulate air pollution exposure and morbidity/mortality among susceptible individuals including those with pre-existing cardiac disease. This study examines the *in vitro* cardiotoxicity of bioavailable constituents of various combustion source particles and attempts to identify molecular pathways of susceptibility to the cytotoxic effects of these constituents. This study found that aqueous extracts of residual oil fly ash (ROFA) displayed the most cardiocytotoxicity. Culturing conditions were found to influence the cardiotoxicity of bioavailable ROFA constituents. Confluent cardiomyocyte cultures maintained in high serum seemed to be more protected from ROFA leachate material than similar sub-confluent cultures maintained in lower serum medium. Genistein, a kinase inhibitor, enhanced the cardiotoxicity of ROFA constituents. Aqueous and organic extracts of coal fly ash (CFA) were found to have no cytotoxic effect on cardiomyocytes. Ultra-fine CFA at high dose appeared to produce a negative chronotropic effect on cardiomyocytes. Organic extracts of on-road diesel exhaust particles (DEP) seemed to have cytotoxic and negative chronotropic effects on cardiomyocytes. Polar components found in methylene chloride and methanol fractions of on-road diesel particles appear to produce negative chronotropic effects without cardiotoxicity. These studies demonstrate that bioavailable constituents present on various combustion source particles can produce direct adverse cellular and functional effects on cardiomyocytes.

SULLIVAN, STEPHANIE. Tau Epsilon, Kennesaw State University--The influence of Echinacea on developing chick embryos.

Echinacea is a centuries old natural remedy commonly taken by individuals today, including pregnant women, for colds, flu, and other ailments. One observed impact of echinacea on human and animal physiology is the stimulation

and increase of the number of white blood cells (Tarken, 2000). The purpose of this research was to observe the influence echinacea would have on developing, ex-ovo chick embryos. Since pregnant women may take echinacea, a more complete picture of the herbs influence on the developing embryo was conducted. Observations of the white blood cell count, rate of growth, survivability, and instance of gross morphological abnormalities were performed. To observe these characteristics and ensure similarity in echinacea treatment, chick embryos were cultured outside of their shell and growth was observed up to day seventeen. The study resulted in no significant difference in weight, abnormalities, hematocrit, and differential white blood cell counts for the echinacea treated embryos. However, the range of death for the echinacea treated embryos was significantly different in the echinacea treated group compared to two of the three controls, and nearly significant with respect to control three.

SWANSON, BRYAN M. Sigma Nu, The University of Tampa--The effects of tide, temperature and light on the direction of vertical movements in the mangrove tree crab *Aratus pisonii* (Brachyura, Grapsidae).

A field study was performed to test the effects of light, air temperature and tide on the direction of the vertical migrations in the mangrove tree crab *Aratus pisonii*. From November 2001 to October 2002, the movements of *A. pisonii* were recorded monthly over a one-day cycle in a mangrove forest along Gandy Bridge, St. Petersburg, Florida. Four migration patterns were observed throughout the one-day cycle. A morning upward migration commenced at sunrise, followed by a morning downward migration as temperature increased. An evening upward migration was initiated as light levels decreased followed by an evening downward migration as temperature began to decrease. This is the first time that *A. pisonii* has found to exhibit distinct patterns of vertical movement affected by these abiotic factors.

**ABSTRACTS  
DISTRICT II  
PAPER SESSION**

BROWN, JOANNE. Mu Omicron, Columbus State University--The differential effects of nickel on 4 strains of the nematode, *Caenorhabditis elegans*.

Nickel concentration in the environment of *Caenorhabditis elegans* may effect its longevity. The genetic variants of *C. elegans* known to promote advanced longevity (*clk-1*, *daf-2*, and *daf-2/clk-1*) would be expected to show affects in an inverse proportion if the ability to detoxify nickel in the substrate were disrupted. Ten nematodes per variant, with four repetitions, were subjected to varying concentrations of nickel treated nutrient gel plates and monitored daily for twelve days for developmental disruptions and LC50. Data from these tests were analyzed using TOXSTAT. The null hypothesis states there would be no significant difference between the sensitivity to nickel of the mutated *C. elegans* and the wild type. From the statistical analysis, the null hypothesis was rejected. Related research showed an increase in heavy metal tolerance in 24-hour test

trials with *C. elegans*. This research is in contrast to the results achieved using nickel in 12-day test trials, possibly due to the length of the experiments and/or the heavy metals tested. Other nematode aging studies have shown that there is no tradeoff with fecundity. Additional research is needed to establish a relationship between the mutations in nematodes, nickel exposure, and the human disease genes known to be of similar genetic constitution.

COOPER, JONNIFER AND EDULIN H. WALKER, JR. Eta Mu, Southern A&M--The synthesis and investigation of titanium oxide using the novel self-initiating gel precursors.

We have prepared nanocrystalline titanium oxide using the novel self-initiating precursor gel. The self-initiating precursor gel is composed of a homogeneous mixture of titanium acrylate salt dissolved in an ammonium acrylate gel. Ammonium acrylate gel was found to have the significant ability to absorb many times its own weight of water. Similar properties have been identified in PMMA Poly (methylMethcryalte) and sodium polyacrylate. However, the ammonium salt remains an un-polarized monomer. It has been determined that gellation occurs in the ammonium acrylate system due to condensation of ammonia with vinyl group of acrylic acid in an anti-Markovnikov addition reaction. These compounds form a strongly hydrogen-bonded network that is responsible for gellation of aqueous solutions. However, gellation is reversible since additional water can loosen the hydrogen-bonded network. Because ammonium acrylate possesses a high aqueous solubility, and, because the ammonium acrylate gel effectively dissolves other metal acrylate salts, excellent control of stoichiometry is possible. In addition, the synthesis of the nanocrystalline titanium oxide was achieved in as little as four hours (700 degrees C) with uniform particle sizes and narrow particle distribution. The novel self-initiating precursor gel and thenanocrystalline titanium oxide were characterized by thermal gravimetric analysis/differential scanning calorimetry (TGA/DSC), X-ray diffraction (XRD), and transmission electron microscopy (TEM).

FRY, MICHELLE A. Mu Iota, Northern Kentucky University--Investigating the link between a dinoflagellate and marine head and lateral line erosion of brown sailfin tangs, *Zebrasoma scopas*.

Fish diseases in aquariums, both commercial and personal, are common and captive fish are very susceptible to disease. The goal of my research was to determine if there is a link between a dinoflagellate and a serious fish disease, Marine Head and Lateral Line Erosion (MHLLE). MHLLE was found affecting fish at the Newport Aquarium and I found a dinoflagellate which appears to be associated with the diseased fish. The dinoflagellate exists in association with marine sponges, protista, and other invertebrates and has proven difficult to isolate. In addition, it forms cysts and is resilient to known disease treatments. I established experimental tanks containing the dinoflagellate and healthy brown sailfin tangs, *Zebrasoma scopas* and control tanks containing healthy *Z. scopas* only. Water samples from all tanks were cultured for bacteria, the results of which showed bacteria was an unlikely cause of MHLLE. Visual assessments using a 35-millimeter and digital camera were used to determine the progression of the disease. In addition, skin scrapes of all fish were conducted to determine if

the dinoflagellate is parasitic. Results thus far suggest the dinoflagellate does cause MHLLE, and the most likely mechanism is through production of a toxin.

GENNUSO, SONJA A. Eta Mu, Southern A&M--Insertional mutagenesis screen for genes involved in otic/vestibular development in *Xenopus tropicalis*.

*Xenopus tropicalis* was chosen as the most efficient protocol for this study because it shares the three-dimensional semicircular canals and other structures associated with the vestibular system, its external embryogenesis, short generation time, diploid cells, and relatively inexpensive upkeep. In order to observe properly the development and function of the otic/vestibular system, fluorescent proteins such as green fluorescent protein (GFP) and red fluorescent protein (RFP) were used as gene "trackers." Fluorescent proteins serve as gene "trackers" because once they are inserted and actively transcribed into an animal's genome, these proteins glow under fluorescent light and make that particular region of the body easily visible. The process of implanting such a protein into an animal's DNA is called insertional mutagenesis. Four days before the insertional mutagenesis process, the female frog is primed with 5 units of pregnant mare gonadotrophin (PMSG) in order to induce the oocytes into maturity. From there the female frog is then injected with 50 units of human chorionic gonadotrophin. This injection causes the frog to lay eggs removes partially, the jelly egg coat from the eggs. Each egg is then injected with sperm and a transgene agent containing a fluorescent protein. Approximately one hour after the eggs have been injected, the first symmetrical cleavage appears. Embryos that express normal symmetrical cleavages are then isolated for traces of the fluorescent protein at about stage 28. Embryos that develop abnormally mature enough to express fluorescent proteins and are also isolated and kept for screening.

HILL, MARY. Mu Omicron, Columbus State University--The effect of aposematic coloration on the food preference of *Aphelocoma ceorulescens*, the Florida scrub jay.

Aposematic coloration, commonly observed in noxious organisms, serves as a warning to predators to avoid attacking specific prey. This coloration is conspicuous in nature, with one of the most common examples being a red and black pattern. The plant *Abrus precatorius* exhibits this warning signal in its beans, which resemble lady beetles and contain the concentrated toxin abrin. *Aphelocoma ceorulescens*, an endemic and federally threatened bird in the state of Florida, shares a similar distribution with *Abrus precatorius*, making interaction between the two species possible. Using an edible model of the *Abrus* bean, this potential interaction was tested in Martin and Palm Beach County populations of *Aphelocoma ceorulescens* by presenting a red and white bean to individual scrub jays to determine whether they showed a preference for or avoidance of the red model bean. Results showed a significant tendency by the birds to prefer white over red, indicating that the color, independent of other warning signals, functions aposematically to discourage predation of *Abrus precatorius* beans.

HUDGINS, SARALYNNE E. Mu Chi, Midway College--Comparison of antibiotic susceptibility profiles of *Escherichia coli* isolated from horses, cattle, and humans.

The contamination of natural waterways with untreated fecal material may increase the risk of disease transmission to humans who use those waters. Knowing the source of pollution is an important factor in determining the degree of risk. Three possible sources include horses, cattle, and humans. Sixteen horse isolates, fifteen cattle isolates and twelve human isolates were identified as *Escherichia coli*. Antibiotic susceptibility patterns revealed ampicillin and streptomycin profiles may be useful indicators in identification of isolates by antibiotic susceptibility testing. Tetracycline and oxytetracycline may also be helpful.

KLEIN, AMY E. Mu Chi, Midway College--Comparison of antibiotic susceptibility testing of stream fecal coliforms to human, horse, and cattle fecal coliforms.

Differentiating between the sources of fecal contamination of water sources continues to be a significant problem, especially in the Kentucky River Basin. In the fall of 2002, 15 water samples were taken from the North and South Elkhorn Creek, and 6 *Escherichia coli* (*E. coli*) isolates were obtained from these samples. Antibiotic susceptibility tests using the Kirby-Bauer Disk Diffusion Method were used to compare the susceptibility patterns of stream fecal coliforms to the patterns of horse, human, and cattle fecal coliforms. Due to a limited sample size, humans, horses, or cattle could not be linked as the source of *E. coli* found in the streams. However, a pattern seems to be developing in which *E. coli* from cattle could more readily be identified based on the susceptibility profiles.

MOHAMEDALI, BURHAN. Mu Iota, Northern Kentucky University--Immunohistochemical detection of serotonin expression in magnesium deprived mice using confocal microscopy.

Mice on magnesium deficient diets have been reported to increase liver expression of the enzyme tryptophan deoxygenase, an enzyme involved in the breakdown of the amino acid tryptophan. Since tryptophan is directly involved in the biosynthesis of the neurotransmitter serotonin, and serotonin is directly involved in brain and intestinal functions, we examined the serotonin expression in magnesium deficient mice. Mouse tissues were fixed in 10% buffered formalin, paraffin embedded and sectioned onto slides. Expression was detected with commercially available antibody to serotonin, and detection with a fluorescent tag using confocal microscopy.

SPAETH, JOHN. Mu Iota Chapter, Northern Kentucky University--Spatial and temporal pollution impacts on native fish diversity in the Ohio River watershed.

Conforming to Section 303(d) of the Clean Water Act, the Kentucky Division of Water has prioritized impacted bodies of water for total maximum daily load of

organic pollutants. Despite the listing of first priority, official evaluation of the health of streams, especially native biodiversity, is done on a limited spatial and temporal scale. We sampled fish communities in four 1<sup>st</sup> priority streams in the Ohio River watershed several times per year to determine the effects of point and non-point source pollution on diversity and abundance of native species. We also monitored water quality parameters at each site. Comparisons by species heterogeneity indices and BACI (Before After/Control Impact) analysis determined diversity patterns in impacted and non-impacted habitats. Species richness and evenness of native fishes were significantly lower at all impacted 1<sup>st</sup> priority sites. In some portions of the watershed, seasonal increases in pollutants (e.g. winter use of ethylene glycol to de-ice planes at the Greater Cincinnati/Northern Kentucky International Airport) were particularly destructive to biodiversity. Other streams were impacted year round by sedimentation, sewage from rural settlements, and runoff from urban sprawl. These results provide some insights into pollution impacts on biodiversity of a threatened North American freshwater ecosystem.

SPURR, PHYLLIS L. Mu Iota, Northern Kentucky University--Lichens as bioindicators of future health within a mature hardwood forest in Grant County, Kentucky.

This study used lichens as bioindicators of general forest integrity in the Lloyd Wildlife Management Area near Crittenden, Kentucky. Two 100 m<sup>2</sup> plots were established and the trees within the plots were surveyed for lichen communities by visualizing eight relevés per tree on the cardinal compass points at the base and 1.5 m from ground level. Five species of lichens were collected and identified chemically from plot one within the interior of the forest. The forest edge was the location of plot two where seven lichen species were collected and identified. Forest edges were disturbed, indicating a loss of forest integrity, while the interior of the forest was undisturbed. This disturbance was indicated by the biodiversity of lichen communities. Lower diversity signifies lower disturbance and higher diversity indicates disruption in the habitat. The species of lichens colonizing the community also indicates the level of air pollution, in the form of sulfur dioxide (SO<sub>2</sub>). Lichens that had known pollution tolerances were in the range of intermediate pollution, no pollution sensitive species were in evidence.

TYLER, ERICA. Mu Iota, Northern Kentucky University--The role of bacteria in the nutrition of isopod and remipede cave crustaceans San Salvador Island, Bahamas.

Bacteria that contain green fluorescent protein (gfp) were used to examine the role of bacteria in cave food chains. *Escherichia coli* with GFP were introduced to four crustacean species under laboratory conditions and were illuminated with UV light. The marine cave isopod *Bahalana geracei* ate food (shrimp) smeared with GFP bacteria, which continued to fluoresce in the gut for ~22-26 hours. Brine shrimp displayed fluorescing in the gut up to 48 hours after suspension feeding on GFP bacteria. The marine cave isopod *Neostenetroides stocki* refused clumps of GFP bacteria mixed with their substrate, which they normally eat. The cave remipede *Speleonectes epilimnius* displayed fluorescence after being placed with GFP bacteria. Overall, bacteria with GFP appear to be useful in monitoring the

dietary habits of various organisms and their digestive rates. In order to produce potentially more palatable gfp bacteria we attempted to insert gfp transposons into strains of cave bacteria using transconjugations with SM10 *E. coli*. So far transconjugation attempts have been unsuccessful.

**ABSTRACTS  
DISTRICT I  
POSTER SESSION**

DAVIS, HAROLD III. Psi, Winthrop University--Biomechanics of the pharyngeal musculature in *Stenostomum*.

The pharyngeal muscles of the platyhelminth *Stenostomum* are a subject that has not received much attention from zoologists. E.W. Pullen described the muscles of the pharynx consisting of both longitudinal and circular layers. J.P. Jennings noted the flaring motion the pharynx made during feeding. *Stenostomum* flares its pharynx which creates a vacuum causing the prey to be sucked into the lumen of the pharynx. The process is of particular interest as *Stenostomum* should not be capable of maintaining a vacuum as they have a low pressure hydrostatic skeleton. Although muscles associated with the pharynx have been identified, the exact mechanism that would allow the *Stenostomum* to sustain a distended pharynx has not been studied. In order to characterize the feeding movements, the flatworms were video taped while feeding, focusing in on the anterior portion of the body. Also, specimens were stained with fluorescently labeled phalloidin highlighting the F-actin of their musculature and displaying the organization of the muscles of the pharynx. A correlation of these observations should lead to an understanding of the operation of the pharynx.

PEJMAN FARHANG. Tau Epsilon, Kennesaw State University--Mathematical modeling of bacterial growth in continuous culture: Investigation of changes in glucose concentration during the continuous culture of *Escherichia coli*.

When we grow bacteria in a growth culture under nutrient limited conditions, bacterial metabolism and growth is affected by a whole array of different variables in the culture. In particular, bacterial growth is affected by physical aspects (such as population density or size), by environmental aspects such as culture concentration, and by cellular variables such as metabolic efficiency or patterns of gene expression. Many models of bacterial growth have been developed, but the most popular and accepted model is one developed by Monod in 1950's. However, this model of bacterial growth is incomplete because although it includes an initial substrate concentration into its equation, it does not take into consideration the change in substrate concentration over time. In this paper we will examine this model of bacterial growth, and also discuss all the different variables that can affect bacterial growth and metabolism in a batch culture. In addition, we will experiment on the change in glucose substrate concentration as an important variable of *E.coli* growth. In our experiment, upon gradual addition of glucose in the medium, we did not detect any significant glucose remaining in the culture at any time. This could be due to fast glucose uptake by the bacterium.

FOBBS, KRISTIN, SATU PUOLITAIVAL AND ELLIOTT KELLER. Tau Eta, Catawba College, Salisbury, NC 28144--Fermentation and flavor in homebrewed beer.

Brewing is a fermentation process where the yeast *Saccharomyces cerevisiae* converts carbohydrates to ethanol and carbon dioxide. Quality beer production demands pure ingredients and a high level of sterility to prevent contamination. One common contaminant is the gram negative bacterium *Zymomonas mobilis*, which can ruin beer flavor. We examined cell growth, ethanol and flavor production in homebrewed beer. The kinetics of ethanol production over the one-week brewing period was determined by gas chromatography and flavors were detected using solid phase microextraction (SPME) coupled with gas chromatography-mass spectroscopy (GC-MS). Suspended yeast population increased rapidly for about 72 hours then declined. Ethanol production reached its maximum of 6% at 72 hours. *Z. mobilis* had a longer lag phase than *S. cerevisiae* and reached a maximum suspended population at about 150 hours. *Z. mobilis* also showed lower ethanol production than *S. cerevisiae*. SPME/GC-MS showed numerous flavor compounds in the yeast-brewed beer including esterified long chain organic acids. *Z. mobilis* produced few flavor compounds. We are seeking to identify the main contaminants produced by *Z. mobilis*, dimethylsulfide and acetaldehyde.

HUTCHINSON, JOHN W. Sigma Tau, Florida State University--Construction of an Actomyosin-based Ni-nanoactuator.

Recent research using the  $F_0/F_1$  ATPase pump as a rotary engine in a synthetic nano-device has ushered in a new era in bio-nanotechnology (Soong, et al. *Science* 290. 1555-1557). Developing nanoactuators devices by the functional combination of organic motor proteins with nano-engineered synthetic structures is the goal of many researchers in this field. The motor protein system of vertebrate skeletal muscle (the actomyosin interaction) is an as-yet unexplored area in nanoactuator development research. My work focuses on using the well-characterized biotin-streptavidin non-covalent linkage system to construct nanodevices that bind functional heavy meromyosin to Ni nanorods. Several linkage methodologies are applied, including coating the nanorods with high-molecular-weight polymers and a novel 6x-His-tagged biotin that binds strongly to the Ni nanorod. These methods are compared for their ability to facilitate construction of a robust nanoactuator system. The first goal is to visualize through fluorescent light microscopy these Ni/HMM nanoactuators moving along isopolar tracks of fluorescently-labeled actin filaments. The alga *Nitella* provides such an isopolar actin array, and is employed in a motility assay to test the efficacy of the nanoactuator in an existing system.

JACOBS, CANDY<sup>1</sup>, SUSAN SEVERSON<sup>1</sup>, AND JOE THOMPSON<sup>2</sup>.<sup>1</sup>Psi Lambda, University of North Carolina at Pembroke and <sup>2</sup>University of North Carolina at Chapel Hill--The morphology and kinematics of *Aurelia aurita*.

We investigated swimming in the ephyrae of the moon jellyfish, *Aurelia aurita* (Cnidaria: Scyphozoa). The morphology of the ephyrae differs dramatically from

the mature medusae, and these differences are likely to alter locomotion in important ways. We analyzed videotapes of ephyrae swimming and quantified several aspects of locomotion. During the swimming cycle we measured (1) the velocity of the animal, (2) changes in the shape of the body, and (3) contraction velocity of the body. We found that the velocity of swimming changes dramatically during the swimming cycle, with negative velocities being present during refilling of the subumbrellar cavity. We also found that the amplitude of contraction of the body is higher in ephyrae than has been reported in the mature medusa. The results of our study illustrate that morphological differences between the ephyrae and the mature medusae are associated with changes in locomotion. Such differences in swimming may also affect prey capture and predator avoidance behavior.

LAUBACHER, MARY E. Sigma Psi, Florida Institute of Technology--PLC $\gamma$  signaling pathway at fertilization.

At fertilization, starfish eggs undergo a calcium increase that is stimulated by a rise in inositol trisphosphate generated by the enzyme phospholipase C $\gamma$  (PLC $\gamma$ ). Not much is known about the molecular pathway leading to activation of PLC $\gamma$ . It is thought that a Src family kinase plays a role, but the identity of the kinase is unknown. A full-length cDNA has been isolated which encodes a starfish PLC $\gamma$  protein. The cDNA sequence for the regulatory domains of starfish PLC $\gamma$  (the SH2 domains) was amplified by PCR and subcloned into a vector for the production of GST fusion proteins. These fusion proteins are being used as a tool for finding proteins that might belong to the PLC $\gamma$  signaling pathway. Protein lysates from unfertilized and fertilized starfish eggs were incubated with the PLC $\gamma$  SH2-GST fusion protein. Unbound protein was removed by rinsing and the remaining protein was visualized by polyacrylamide gel electrophoresis and western blotting. A number of tyrosine-phosphorylated proteins were found to interact with the PLC $\gamma$  SH2 domains both before and during fertilization, but a subset of proteins interact only following fertilization. Two of these proteins were determined to be sperm proteins; while one protein appears to be egg protein.

MALONEY, ANDREA M. Psi, Winthrop University--The relationship between movement and the body-wall musculature of *Parotoplana sp.*

It has long been thought that flatworm motion was created by a hydrostatic skeleton combined with longitudinal and circular muscles. Work done by Tyler and Hooge has shown that there are alternative arrangements. Specimens of the ribbon-like *Parotoplana sp.* (Class Turbellaria, Order Proseriata, Family Otoplanidae) were extracted from sand samples that were taken from the coasts near Wilmington, NC. The movements of the worms extracted from these samples were observed using bright-field video microscopy. Motions that were observed include rotation and curling of the body, compression along the length of the organism, compression dorso-ventrally, side-to-side head wagging, peristaltic waves along the body length, and pharyngeal movement. In order to make the muscle fibers of the worms stand out, several worms were labeled with TRITC and Alexia 488 phalloidin stain. These worms were then observed using fluorescence microscopy and laser-scanning confocal microscopy. The muscles

arrangements that were observed were then related to the motions demonstrated by *Parotoplana sp.*

MARCHAL, JONATHAN D. Rho Pi, Brevard College--A comparison of two order-level biotic indices for southern Appalachian streams.

Macroinvertebrate biotic indices are widely used in the assessment of water quality. Quality values are calculated from field samples using the amount of a particular group of macroinvertebrates collected, the total number of all macroinvertebrates collected, and a predetermined value that illustrates each order's pollution tolerance. Brevard College's laboratory classes utilize a biotic index created in Wisconsin in part because of its ease of use. The North Carolina Department of Environment and Natural Resources makes water quality assessments using the North Carolina Biotic Index (NCBI), which accounts for the sample's geographic region and season and assigns each individual species its own tolerance level. Because identification to species may be difficult for beginners, assigning a mean tolerance value for each group could make the NCBI more user-friendly. Both indices were compared using samples collected from three locations on the Davidson River (each location with distinct physical and recreational impacts) in the months of October through March. Samples were collected using a kick-net technique and were conducted at each location eighteen times. The results of the comparison show that the Wisconsin index overestimates the quality of North Carolina's streams.

MCCLURE, JULIE. Sigma Tau, Florida State University--Yeast two-hybrid investigation of the non-muscle myosin heavy chain carboxyl terminus.

Non-muscle myosin, a member of the myosin II family, is an important component of the cellular cytoskeleton where it likely plays a role in cell contraction and cell movement. One non-muscle myosin molecule is composed of two heavy chains and two light chains, with the tail region consisting of the two heavy chains. Despite the importance of myosin in the cellular cytoskeleton, little is known about myosin's protein interactions. The tail region of non-muscle myosin is of particular interest because it likely controls intercellular localization of the molecule and may also regulate other protein interactions. The yeast two-hybrid system is a growth-based assay to identify novel protein interactions. Using non-muscle myosin heavy chain carboxyl terminus as a "bait" protein, I have screened  $5 \times 10^5$  independent clones of a human lung library and have identified several novel non-muscle myosin heavy chain interacting proteins.

PERKINS, RANDA M. Sigma Tau, Florida State University--"Super-smeller" mice & altered olfactory connections in Kv1.3-null mice.

Gene-targeted deletion of Kv1.3, a *Shaker* subfamily member highly expressed in the olfactory bulb (OB), was explored to better understand the channel's contribution to olfactory processing. We have previously demonstrated that OB neurons from knock-out (KO) mice have slow inactivation kinetics and lack cumulative C-type inactivation. We now show that KO mice significantly outperform wildtype (WT) mice in simple retrieval tasks of hidden food items, a

general test for anosmia. In odor habituation trials, where mice were asked to discriminate between pairs of complex mixtures or between pairs of alcohol odorants differing in carbon chain length, KO mice, however, habituated more rapidly and had significantly greater discrimination. Image analysis (Metamorph) of glomerular cross-sectional area at 5 locations coronally across the OB, indicates that KO mice have smaller glomeruli than that of WT mice (3389 +/- 127 KO versus 3962 +/- 232 mm<sup>3</sup> WT). Since the glomeruli represent a major coding unit for olfactory information, we generated Kv1.3 -/- mice with a targeted P2-IRES-tauLacZ mutation. We hope to use this model to test whether axonal projections in the KO mice converge normally to a single glomeruli representing the P2 odor receptor target. Supported by: NIH DC03387 from NIDCD & Florida Foundation.

RAUF, NIDA. Beta Alpha, Salem College--DNA damage and breast cancer risk.

Breast cancer is the second leading cause of cancer deaths in women. About 205,000 women will be diagnosed with breast cancer and 40,000 will die from the ailment in 2003. There are three established risk factors that account for approximately 40% of breast cancer cases; however, the other 60% of cases have undefined risk factors. DNA repair capacities (DRC) for different genotypes and polymorphisms are evaluated when DNA of cancer/case lymphocytes are damaged, using the comet assay (single-cell gel electrophoresis) and LACAAS (LAI Automated Comet Assay Analysis System). The study focuses on how different polymorphisms and genotypes have a direct effect on cancer risk. Research was conducted with 70 breast cancer cases and 70 controls. The results show that there is significantly higher DNA damage among cancer cells, and the DRC is much lower when compared to controls. These results indicate that cancer lymphocyte DNA is deficit in repair after suffering damage from various carcinogens (for the sake of experiment, induced damage). This low repair rate, demonstrated in breast cancer patients, may be what accounts for their affinity for the disease.

THOMPSON, JALONDA N. Beta Alpha, Salem College--The effects of hypothalamo-pituitary disconnection on corticotropin-releasing hormone type 1 receptor levels in late gestation fetal sheep.

The expression of corticotropin-releasing hormone type 1 (CRH-R1) receptor levels decrease in late gestation fetal sheep. Previous research has shown that hypothalamo-pituitary disconnection (HPD) hinders the development of corticotrophs. The exact mechanism of the hypothalamic input on corticotrophs is unknown. We hypothesize that a HPD surgery at 120 days gestation (dGA) will alter the hypothalamic input to corticotrophs and CRH-R1 receptor expression. A HPD or sham surgery was performed on fetuses at 120 dGA. We measured CRH-R1 receptor levels from the anterior pituitary by western blotting in HPD and sham fetuses at 140 dGA. The results showed that CRH-R1 protein levels in HPD fetuses were higher than the sham fetuses. We also saw that CRH-R1 protein levels in HPD fetuses did not differ from the 120 dGA fetuses. We conclude that hypothalamic input is necessary for the decrease in CRH-R1 receptor protein levels in late gestation fetal sheep.

WASON, AMANDA C. Rho Pi, Brevard College--Sex differences in the behavioral ecology of mantled howling monkeys (*Allouatta palliata*).

A variety of differences exists between the sexes in many species of primates. This study tested my hypothesis that mantled howlers' activity budgets, locations within the group, and methods of locomotion would depend upon the sex of the individual. The observational study was done in a total of 40 hours over a seven-day period in La Suerte, Costa Rica, using scan sampling and focal instantaneous sampling. The results showed that there is a difference between males and females in the amount of time that they spend foraging/feeding and resting. Females spent more time foraging/feeding and males spent more time resting. There was little difference between the modes of locomotion in the two groups. Males were seen higher in the canopy and towards the outer edges of the group. Given the trends observed in this study, a long-term study should be done to see if these results are the norm.

**ABSTRACTS  
DISTRICT II  
POSTER SESSION**

ATIKOVIC, EMINA. Mu Iota, Northern Kentucky University--Methods for the detection of *Escherichia coli* in soil and plant extracts.

A medium formulated for isolating specific fecal indicator organisms using membrane filter technology is shown to be useful for monitoring levels of these bacteria in nonsterile, natural, environmental samples containing high levels of autochthonous microbial populations. A procedure is presented that determines the levels of *E. coli* in heterogeneous substrates such as soil and plant extracts.

COOPER, JOSHUA T. DIANE K. MCCUBBIN AND MIRIAM STEINITZ-KANNAN. Mu Iota, Northern Kentucky University--Digital imagery of diatoms from the upper Ohio River Basin and selected tributaries, a work in progress.

As a cosmopolitan group of organisms, algae are important water quality indicators. Diatom taxonomy has been recorded from many aquatic systems all over the world. Distinguishing between diatom species involves observations of detailed physical characteristics and specific measurements. We are compiling a taxonomy database of diatom images from the Ohio River Basin as a baseline for identification of common species. The Ohio River was sampled every 5 miles from Pittsburgh, PA to Rising Sun, Indiana including selected tributaries. The samples were collected using a 10- $\mu$ m mesh plankton net during the first week of August 2001 and 2002 as a part of River Run. Samples were boiled in concentrated Nitric Acid to remove all organic material in order to have an unobstructed view of diatom physical characteristics. The diatoms were mounted in Naphrax® mounting medium and counted under oil immersion (1000X) using a compound light microscope. The images were captured using an Olympus D-12 digital camera. Common taxa consisting of mostly centric forms include five

species of *Aulacosiera* and five species of *Cyclotella*, which are found throughout the length of the river. These forms can be difficult to identify to species or variety. This database will be useful to distinguish between similar species found in the Ohio River Basin so that indicator species can be more easily identified.

FOLTZ, REBECCA F. Mu Iota, Northern Kentucky University--*In vitro* expressions of tryptophan deoxygenase in Hep-G2 Cells under low magnesium conditions.

Recent collaborative efforts have been aimed at understanding the effects of magnesium depletion on levels of the enzyme tryptophan deoxygenase (TDO). Tryptophan deoxygenase degrades tryptophan, and decreases in magnesium serum levels have been linked with increased TDO. Furthermore, tryptophan is a precursor to serotonin, so it is possible that magnesium may indirectly affect levels of serotonin via tryptophan deoxygenase. These interactions might influence several physiological processes, from cellular viability and communication, to the biochemical causes or consequences of depression. The purpose of this study was to examine the effects of low levels of magnesium on TDO expression in human liver cells. We have hypothesized that cells in a low magnesium environment will express greater amounts of TDO. Cell cultures were examined using PAGE gel and western blotting techniques, and the levels of TDO from low magnesium cultures were quantified. Although this analysis is currently in the final stages, we believe our results may have important implications for understanding the relationships among magnesium, tryptophan deoxygenase, and serotonin.

MILLER, MELLISA A. Mu Iota, Northern Kentucky University--Nutrient assimilation in Green Frog (*Rana clamitans*) tadpoles.

Green frogs (*Rana clamitans*) are a ubiquitous species in Kentucky, and previous investigations have shown their larvae to consume algae as the largest component of their diet. Other studies on conspecifics have documented that detritus, and not algae are the major dietary food. Our study investigates the assimilation of nutrients based on a strict algal diet in *R. clamitans* tadpoles. Through a series of feeding experiments using algal foods in "tadpole jello" presented to the larvae, we were able to measure various nutritional components of the diet. Food passage rates were also measured both at the beginning and end of the study using fluorescent dye markers in the jello. *R. clamitans* were found to be very efficient consumers of algae. They were able to metabolize 86.6% of the energy they consumed as well 82% of the organic matter available in the algal food. The algal food contained a 37% crude protein content of which 92% was assimilated by the tadpoles. Although algal phosphorus concentrations were low, the tadpoles were able to assimilate most of what was available. On average 90 calories were consumed per group of five tadpoles. Clearance rates were found to be 9.8 hours at both the beginning and the end of the study.

QUAMMEN, JENNIFER K. Mu Iota Chapter, Northern Kentucky University--Do tadpoles have a stomach?: Evidence of enzymatic activity in the Wood Frog (*Rana sylvatica*).

Digestive physiology in anuran tadpoles is a relatively unstudied area of biology. The gastrointestinal tract in these larvae consists of a simple tube with little differentiation of distinct organs. An enlarged section of the foregut, the manicotto glandulare, is suspected to have gastric function. This manicotto glandulare is acidic in pH and morphologically different from the otherwise long and tubular gut. The activity of digestive enzymes reported varies considerably. We are interested in understanding the digestive characteristics of anuran larvae, specifically enzymatic activity. Quantitative enzymatic assays for pepsin, lipase, amylase and trypsin were measured for entire GI tract from homogenate in the larval anuran, *Rana sylvatica*. Activity was detected for each of these enzymes within the gut. The enzyme of highest activity was trypsin, followed by lipase, amylase, and pepsin. The presence of a functioning stomach has not been verified in larval tadpoles. Our examination of digestive enzyme activity also included quantitative pepsin assays for five sections of the GI tract to determine the position of maximal pepsin activity. From these data, *R. sylvatica* tadpoles were found to have the highest level of pepsin activity in the area of the manicotto glandulare, suggesting that it is an enzymatically functional stomach.



Panel discussion following the Thursday symposium entitled:  
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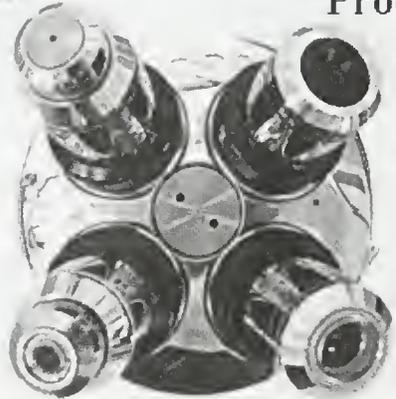
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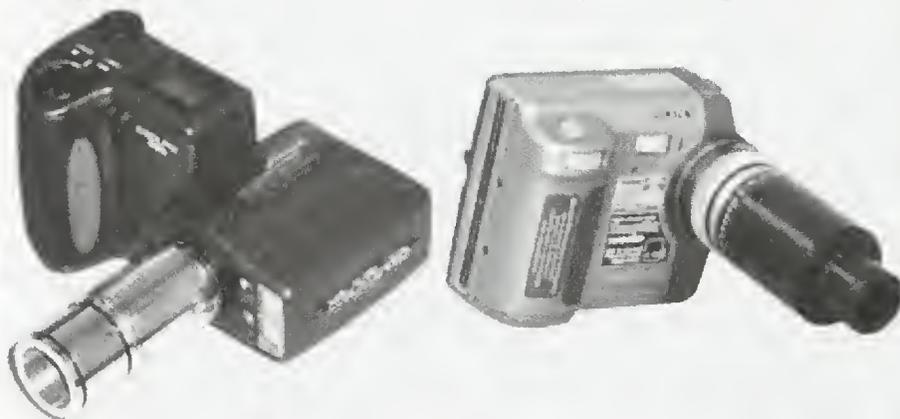


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