

## **ABSTRACTS (alphabetical order)**

### **Sarah Abbott '06, Rachael Levitz '06, and Samantha Piro '05**

Lee Abrahamsen, Biology

#### ***Equine Pastern Dermatitis: A Look into the Varied Causes of This Common Infection***

Equine pastern dermatitis is a commonly occurring skin infection among horses. Also known as scratches, the exact cause of this disease is unknown; however, one theory states that it is a progressive disease that involves the presence of bacteria, fungus, and mites. This study looked at the possible causes of scratches by collecting lesion samples from eleven draft horses in Maine. Bacterial and fungal plates were grown, and outer skin and hair samples were collected and examined for mites. The Kirby-Bauer antibiotic sensitivity test was initiated to test for antibiotic resistance among common treatments for scratches. We found a wide variety of predominantly Gram-positive bacteria, which were most sensitive to penicillin and chlorhexidine. We found no mites or predominant fungus in any sample. Our results suggest that bacteria play a role in chronic scratches.

### **Tabitha Abrazinski '06**

Joseph Pelliccia, Biology

#### ***Annotating the Putative Arylsulfatase Gene, *sul-1*, in *C. elegans****

Based on genetic sequence comparison, the *gk151* allele of the *C. elegans* genome has been predicted to be an arylsulfatase called *sul-1*. Using reverse genetics the *C. elegans* Knockout Gene Consortium deleted the allele. Using a specific activity assay I have determined that the *gk151* allele does code for an arylsulfatase as determined by reduction in sulfate hydrolysis as compared to hydrolysis in wildtype worms. Observations concerning movement, lifespan, and fecundity were documented to acknowledge a discernable phenotype.

### **Jeffrey Addis '06**

John Strong, Religion

#### ***Thai Sangha HIV/AIDS Projects: Approaching the Pandemic in a Buddhist Context***

I have investigated Thai Buddhist clergy members' responses to the pandemic by 1) reshaping or revitalizing their roles in secular society; and 2) formulating a religious framework, incorporating traditional doctrines with biomedical understandings of transmission and contraction, with the aim of ending the suffering from AIDS. Distinct from ending AIDS, ending the suffering from AIDS is rooted in eliminating ignorance which entails following Buddhist moral commandments--such as not visiting brothels--as well as considering the concept of nirvana.

### **Christine Anderson '06**

Melinda Harder, Mathematics

#### ***Assessing Mortality Data Using Survival Analysis and Logistic Regression***

The purpose of my mathematics thesis is to analyze mortality data using statistical techniques. The National Center for Health Statistics (NCHS) releases an abundance of data on mortality and health conditions, but what are we to make of all these data? I look at how the NCHS collects and releases these data and how researchers have used them in previous studies. Using the data collected from the NHANES I Epidemiologic Follow-up Study (NHEFS), I examine the relationships of gender, race, and other variables of mortality.

### **Emma Arenstam '08**

Carol Dilley, Dance

#### **The Other**

*The Other* is an original composition for Dance 351 (Advanced Composition Seminar). *The Other*, performed to the music of Samuel Barber, uses theatrical elements, props, and modern dance to portray a haunting look at the frustrations in building human connections. Dancers include Sarah Bumbarger '08, Elizabeth Sheridan-Rossi '06, and Gabrielle Voeller '07.

**Emma Arenstam '08, Eric Auner '08, Marisela Fermin '08, and Chloe Raynes '08**

Carol Dilley, Dance and William Matthews, Music

***Atelier***

Dance/Music 337 (*Atelier*) focuses on making short digital films that combine music and dance. This presentation includes four works produced in the course; each is about six minutes long.

**Christine Arsnow '08**

Sylvia Federico, English

***An Author's Responsibility: T. H. White's Message to World War II Era Youth***

T. H. White's *The Once and Future King* is written to an audience of British children in the midst of World War II. As a popular children's author, White believes that it is his responsibility to use his power to guide a disoriented generation towards peace and unity. He uses examples throughout the novel to convey the temptation of evil, the danger of indifference, and the hopeful prospect of peace after the war.

**Anne Barton '08**

Dolores O'Higgins, Classical and Medieval Studies

***Missing from the Equation: Briseis and the Iliad***

At first glance, the *Iliad* presents Briseis exclusively as a symbol of Achilles' standing among the Greeks. Yet, the evolving narrative hints at a much deeper relationship with Achilles. Since the whole story springs from Achilles' rage at the unfair seizure of Briseis, I examine the ambiguities of the depiction of Briseis as both a war prize and a lover.

**Anne Barton '08, Erin Faulder '08, Molly Madzellan '09, Magdalene McCally '08, and Anna Meader '09**

Henry Walker, Classical and Medieval Studies

***Performing Seneca's Medea***

Five students perform a short scene from *Medea*, one of Seneca's plays, in Latin. The performance includes a set and costumes that are appropriate to the period and English translations are provided.

**Gabriel Belsky '06**

Todd Kahan, Psychology

***Is Negative Priming Dependent on Prime-Trial Interference?***

People are slower to respond to stimuli that were previously ignored relative to stimuli that were not previously ignored. In these negative priming experiments participants respond to two items: the prime and probe. On the prime participants respond to target information, under the guidance of a cue such as color, while distracting information is present. In the subsequent display, the probe, participants respond to a target in the same fashion. People show increased latency of response when the target on the probe trial matches the distractor from the prime, relative to situations where the target on the probe trial bears no relation to the prime-trial distractor. This study evaluates whether negative priming is dependent upon prime conflict, and prime-probe response alternation. Participants are 30 undergraduate students from a northern New England liberal arts college, between 18 and 22 years of age. Implications for theories of selective attention are discussed.

**Jenna Benson '06**

Amy Douglass, Psychology

***The Cycle of Violence and the Androscoggin Children's Advocacy Center***

My study addresses the cycle of violence and examines the Androscoggin Children's Advocacy Center (ACAC) as a program attempting to interrupt that cycle. The ACAC provides a safe, child-friendly atmosphere in which a child sexual abuse victim can be interviewed by representatives of investigative

and support agencies. The intention is that the child has to relive the trauma only once, thus alleviating the ultimate effects of the trauma. I worked alongside the director of ACAC and created a list of referral agencies within the Lewiston-Auburn area for families involved in the program. I will address the advantages of a program such as ACAC in interrupting the cycle of violence; and explore current concepts such as restorative justice; and consider future directions for alleviation of violence in our communities.

**Winton Black '07**

*See Education Panel*

**William Boe-Wiegaard '06**

Jennifer Koviach, Chemistry

***The Development of Anti-HIV Fullerene Derivatives***

Fullerenes or “buckyballs” represent the third known allotrope of carbon; the other two being diamond and graphite. Buckminsterfullerene, more commonly referred to as C<sub>60</sub>, is comprised of sixty carbon atoms and takes the molecular shape of a soccer ball. Synthetic methods for mass production were discovered in 1990, five years after the molecule was discovered. Since that extraction breakthrough, buckyballs have appeared in every field of science from chemistry, to physics, to biology. The first biological application of fullerenes came in 1993 when Simon H. Friedman discovered that C<sub>60</sub> fit snugly into the active site of the human immunodeficiency virus’ aspartyl protease (HIVP). Because HIVP is required for HIV replication, the development of anti-HIV fullerene derivatives has progressed dramatically over the past twelve years and will continue to do so because of the need for more potent and cost effective anti-HIV therapies.

**Lindley Brainard '06**

Heather Lindkvist, Anthropology

***Allopathic and Alternative Medicine at a Crossroads: The Impact of Edgar Cayce on Contemporary Holistic Medicine***

During a time in which concepts of holistic healing were non-existent in the United States and allopathic medicine was beginning to dominate the medical field, Edgar Cayce, a clairvoyant diagnostician, was prescribing holistic treatments. Because of this, contemporary practitioners often credit Cayce as the “father of holistic health” in the United States. Cayce’s treatments of patients often employed both known and unknown methods of healing, including traditional western medicine, osteopathy, homeopathy, hydrotherapy, natural remedies, and different chemical interventions. In line with modern holistic approaches to healing, his recommended treatments encompassed the whole person, going beyond physical symptoms to address the mental, emotional, and spiritual needs of the patient. This presentation examines Edgar Cayce’s work as a medical diagnostician, his influence in the contemporary holistic health movement, and how he opened the door to the current holistic health movement during a time when allopathic methods dominated the field of medicine.

**Jonathan Browner '08**

Sylvia Federico, English

***Inverted Worlds: The Significance of Environments in Sir Gawain and the Green Knight***

Medieval works of literature typically share common themes and patterns. One of these is the characterization of the castle as a safe haven where homosocial bonds and piety protect knights from the evils of the wilderness, which is typified by evil and often feminine forces that tempt the knight to sin. This presentation explores an inversion of this model in *Sir Gawain and the Green Knight* and the consequences which result.

**Rashel Burton '07, Kate Russell '06, and Katharina Unger '06**

T. Glen Lawson, Chemistry

***Inhibition of Oxidative Phosphorylation in Cauliflower Mitochondria by Weed-B-Gon (2,4-D)***

Oxidative phosphorylation is the process by which electrons are transported by a chain of oxidation-reduction reactions to drive the synthesis of ATP, and it occurs in the mitochondria of eukaryotic cells. There are numerous ways for oxidative phosphorylation to be disrupted, which are fatal to the organism. Several herbicides have been found to inhibit respiratory complexes in the electron transport chain. We used a dissolved oxygen package to measure the rate of oxygen consumption to test the effects of a common herbicide, Weed-B-Gon (2,4-D), on oxidative phosphorylation of cauliflower mitochondria.

**Jason Buxbaum '08**

David Elliott, Harvard Center for Community Partnerships

***Dirigo Health and Public Perception: A Media Tracking and Analysis Project***

“All politics is local,” former U.S. Speaker of the House Tip O’Neill famously said. Indeed, there is much truth in this statement, and thus media coverage – as the most effective conduit between policymakers and the general public – may often be essential for the preservation of highly salient public policy endeavors. Working with the Maine State Governor’s Office of Health Policy and Finance, I have compiled a database of print media references that address any of the highly contentious Dirigo Health Initiatives. In this presentation, I offer insights into how the media--and individual Mainers, as expressed through letters to the editor--are reacting to Dirigo. What trends are evident? How much difference actually exists among the various newspapers in Maine?

**Siena Calabro '06**

John Kelsey, Psychology

***Effects of SR141716, a CB1 Receptor Antagonist, on the Establishment and Expression of Locomotor Sensitization to Nicotine Administration***

Recent studies have found that cannabinoid antagonists--drugs that block specific cannabinoid receptors in the brain--are effective in reducing the self administration and the conditioned place preference of drugs such as cocaine, opiates, alcohol, and nicotine. These findings suggest that cannabinoid antagonists may be helpful in reducing the addictive properties of drugs. The current experiment will explore the effects of a cannabinoid antagonist (SR141716) on a measure of addiction in rats, called locomotor sensitization. It is predicted that SR141716 will reduce the increased activity of the rat due to a nicotine injection. In preliminary data, SR141716 appears to suppress the activity produced by nicotine, but does not appear to prevent the development of sensitization as measured on a challenge test given with SR141716. More tests will soon be completed to determine the overall effect of SR141716 on nicotine addiction in rats.

**Devon Carroll '06**

Susan Langdon, Psychology

***Strategies Used for Appetite Suppression among College Females***

Research suggests that the use of appetite suppressants on college campuses nationwide is a problem that warrants concern because of health risks associated with abuse. However, little is known about the prevalence of appetite suppression strategies, what students believe about appetite suppression strategies, how agents are obtained, frequency and quantity of intake, and what students expect from use. Results indicate that 21.5% of participants report using caffeine products; 7.6% of participants report using diet pills; 5.7% of participants report using herbal supplements; and 6.3% of participants report using amphetamines to suppress appetite. Approximately 35% of participants reported that they had used multiple strategies to suppress appetite. Ten females who were identified as amphetamine users were interviewed to evaluate the perceptions, beliefs, and assumptions associated with using amphetamines to suppress appetite. Multiple themes were identified across users. The implications

of these studies, as well as suggestions for future research, are discussed.

### **J. Matthew Chudomel '06**

Thomas Wenzel, Chemistry

#### ***Dimerization Properties of Chiral Solvating Agents***

New chiral solvating agents have been developed in the lab and their properties are being tested. Initially, the compounds were nicknamed SCR-Pro, SCR-SMOP, and SCR-PyrMOH. These CSAs should provide different chemical shifts when they are added to sets of enantiomers and NMR spectra are recorded. The hope is that one CSA will shift the peaks of one enantiomer more than the other and the two enantiomers can then be discriminated in that way. These CSAs also can react with each other and form a dimer, in which two molecules are “stuck” together. The dimerization properties were examined by diluting solutions of CSA in water in 0.1mM increments from 10mM all the way down to 0.1mM. These tests were repeated for each CSA at three different pH's. By looking at pH 2, 6, and 12, we can see how the dimerization changes as the chiral part of the CSA is deprotonated.

### **Meghan Cochrane '06**

Stephanie Richards, Biology

#### ***Autoimmunity to Type V Collagen and Lung Allograft Rejection in Miniature Swine***

Lung transplantation is the only therapeutic treatment for people suffering from different end-stage lung diseases (Haque et al., 2002) including emphysema, cystic fibrosis, pulmonary fibrosis, and pulmonary hypertension (Allan et al., 2002). The major obstacle to long-term allograft acceptance and recipient survival is chronic rejection (CR) (Haque et al., 2002; Sayegh and Turka, 1998). The principle manifestation of CR in the lung is obliterative bronchiolitis (OB) (Sayegh and Turka, 1998; Allan et al., 2002), which restricts airflow in the lung. Although alloimmunity to donor MHC antigens is the primary mechanism leading to CR, studies have demonstrated that antigens such as type five collagen (colV), a minor collagen found in connective tissues of the lung, can initiate a host-immune response. Under normal conditions, colV is complexed within type I collagen; however, the inflammation and extensive remodeling caused by transplantation exposes colV peptide fragments to the host immune system, leading to organ rejection (Sumpter and Wilkes, 2004). The purpose of this study is to determine whether the development of reactivity to colV correlates with lung allograft rejection in a whole-lung miniature swine model. It will be determined by ELISA whether sera from recipient swine that reject their lung allograft develop antibody to colV compared to sera from naïve and tolerant animals. We hypothesize that reactivity to colV correlates to the development of chronic lung allograft rejection. It is anticipated that serum from rejecting pigs will contain antibody to colV, whereas sera from naïve and tolerant animals will not.

### **Allison Coville '06**

Kathryn Low, Psychology

#### ***Early-Onset Bipolar Disorder: Developmental Pathways to Expressed Emotion in Parents***

Early-onset bipolar disorder (BD) is a chronic, deleterious illness whose course is strongly influenced by the family environment. This study examines the characteristics of BD in youth that contribute to the development of certain parental attitudes. Parental attitude is assessed in terms of expressed emotion (EE), which is based on incidents of criticism, hostility, and emotional over-involvement towards the child. Studies have shown that patients in high-EE families are more likely to experience a relapse episode than patients in low-EE families. Participants were 44 youth (21 males, 23 females) between the ages of 8 and 18, recruited by the Colorado Family Project in Boulder, CO. Demographic, diagnostic, EE, and illness history data were collected from audio-taped interviews with parents. Variables such as gender, family history, symptom severity, and duration of illness are examined as potential predictors that lead to parental EE in adolescence. Preliminary results show a gender difference

in terms of illness onset, in that boys are more likely to experience onset of BD in childhood, while girls are more likely to experience adolescent onset.

**Sorina Crisan '07, Kathleen Hluchyj '06, Christina Jones '07, Sophie Mann '08, Lois St. Brice '07, Caitlin Tamposi '08 and Rebecca Westlake '07**

Francisca López, Spanish

***Visions of Morocco***

During Short Term 2005, seven of us went to Morocco for two-and-a-half weeks as part of French/Spanish s32 (Morocco: Sites of Cultural Encounters). We traveled to eleven different cities, experiencing the diversity of Moroccan landscapes from the Sahara Desert, to farmland, to the Spanish-influenced northern coast. We concentrated our academic research on the role of women, the developing economy, the role of religion, and cultural influences in post-colonial Moroccan society. We each kept a daily journal of our experiences in French, English, or Spanish, three of the spoken languages in that country. Our poster reflects the varied landscapes and economic markets of this diverse country.

**Shelly Davgun '06**

Nancy Kleckner, Biology

***Molecular Characterization and Pharmacological Analysis of *Helisoma trivolvis* Glutamate Receptors *Hel-GluR1* and *Hel-GluR7****

Glutamate is a neurotransmitter involved in *Helisoma trivolvis* feeding and is known to excite certain neurons while inhibiting others. This activity maintains a rhythmic feeding pattern and further illustrates that glutamate activates two different receptor-types. The excitatory receptors are known to be similar to vertebrate KA and AMPA receptor types based upon previous research with glutamate agonists and antagonists. In this research partial excitatory glutamate receptor clones, *Hel-GluR1* and *Hel-GluR7*, will be fully sequenced and expressed in vitro to obtain a better understanding of the physiological response to glutamate, KA, and AMPA. RACE and PCR techniques were used to amplify the sequence and the full-length clones will be ligated into an expression vector. RNA transcribed from this cDNA injected into *Xenopus* oocytes to study receptor expression and conduct dose-response analysis. In vitro expression will provide insight to the pharmacology of glutamate receptors in *Helisoma*, and will aid receptor characterization in related species.

**Emily Davie '06**

Rebecca Sommer, Biology

***Investigations into Putative Dioxin Response Elements Upstream of Beta-Adrenergic Genes***

2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) is a carcinogenic chemical found as a contaminant in herbicides and pesticides. Acute high-dose exposure causes organ damage and facial abnormalities, while chronic exposure causes birth defects, immune suppression, heart abnormalities, and cancer. TCDD is hypothesized to work through the aryl hydrocarbon receptor (AhR) and the aryl hydrocarbon receptor nuclear translocator (ARNT) to increase expression of the  $\beta$ 1-adrenergic receptor ( $\beta$ 1-AR), which regulates heart function. AhR and ARNT bind together in the presence of TCDD, creating a protein dimer that binds to short sequences in promoter regions of DNA called dioxin response elements (DREs), altering transcription rates for that gene. Several genes are known to be upregulated by AhR and ARNT binding. Using electrophoretic mobility shift assays (EMSAs) this study will investigate whether DRE's found in the promoter regions for the  $\beta$ 1-AR bind to a complex of AhR, ARNT, and an activating ligand.

**Matthew DeFina '06**

Nancy Kleckner, Biology

***Cloning a Glutamate Receptor from the Mollusk Biomphalaria glabrata***

Glutamate receptors, present in the post-synaptic region of neurons play an important role in excitatory interactions between neurons. Specifically in mollusks, glutamate receptors have been shown to play a role in the repeated pattern of excitation of multiple neurons that leads to the rhythmic feeding behavior observed. This project is focused on sequencing glutamate receptors thought to be present in the pond snail *Biomphalaria glabrata*. This is carried out using non-degenerate primer PCR based on receptor sequence cloned from a closely related snail, *Helisoma trivolvis*. If the sequence does not prove to be homologous enough to facilitate the use of non-degenerate primers, degenerate primer PCR will then follow. Once a partial sequence has been obtained a full sequence can be found using these techniques in conjunction with RACE PCR. The sequencing of a glutamate receptor from *Biomphalaria* will allow for a greater understanding of how glutamate receptors function and will further our understanding of how they contribute to the creation of rhythmic patterns of excitation.

**Kara Deitrich '06**

See *Sociology Panel*

**Jonathan Duchette '06**

Michael Retelle, Geology

***Surficial Materials Mapping of the Buckfield 7.5' Quadrangle and the Deglaciation and Late Wisconsinan History of the Martin Stream Valley, Androscoggin County, Turner, Maine***

Surficial materials data were produced and analyzed to determine a model of deglaciation for the Martin Stream Valley, specifically the Turner Plains in Turner, Maine. Stratigraphic columns and surficial data were produced in the summer and fall of 2005 justifying models of deglaciation. This project evolved from an internship in the summer of 2005 with the Maine Geologic Survey, which helped to produce a surficial materials map of the Buckfield 7.5' Quadrangle. Surficial materials include the detailed mapping of approximate grain size and layering from within sand pits and road cuts, the location of bed rock outcrops, and the research of well log data. Mapping and stratigraphic data have shown that the Turner Plains is most likely a regressive marine delta, which formed during the fall of late glacial marine waters because of isostatic rebound from its maximum inland extent in North Turner, near Bear Pond.

The Turner Plains is a flat-topped, gravelly-sandy plain that grades from 390 feet in elevation near Bear Pond to 340 feet near Crystal Pond in Turner Center. The sandy surface of the Plains overlies a fine-grained silt unit seen in numerous well logs and bridge borings and is presumed to be equivalent to the late Pleistocene marine Presumpscot Formation. The timing of deglaciation along with the chronology of events leading to the formation of the Turner Plains are currently under study.

**Brian Dupee '06**

William Ambrose, Biology

***The Effect of Baitworm Digging and Epibenthic Predation on the Growth and Survivorship of the Soft-Shell Clam Mya arenaria and on the Abundance and Diversity of Soft-Sediment Infauna***

The effects of harvesting intertidal species on soft-sediment communities are relatively unknown. We examined the effects of digging for blood worms (*Glycera dibranchiata*), epibenthic predation, and the interaction between the two on the growth and survivorship of juvenile and commercial-sized soft-shelled clams (*Mya arenaria*) as well as on infaunal species abundance and diversity. Commercial- and juvenile-sized clams were seeded into dug and undug plots on an intertidal mudflat in mid-coast Maine. Caging treatments were established in all plots for predator exclusion. Preliminary results suggest that digging reduces the abundances of *Heteromastus filiformis* and *Gemma gemma* by 46%

and 64% respectively, while digging increased the abundance of *Nereis virens* 63%. Caging and the interaction between digging and caging had no significant effect on infaunal abundances. Preliminary results also indicated that digging had a negative effect on growth and survivorship rates of juvenile- and commercial-sized clams. Understanding the effects of digging and predation on the survival and growth of the soft-shelled clam and on infaunal abundance will elucidate the degree of community response to digging, enabling effective management of intertidal communities and the baitworm fishery.

### **Jessica Edgerly '06**

William Ambrose, Biology

#### ***Trophic Role of the Invasive Crab *Carcinus maenas* in a Southern Maine Marsh Described by Stable Isotopes and Gut Contents***

*Carcinus maenas*, the invasive green crab, is highly abundant in southern Maine marshes, though it is largely unstudied in this ecosystem. My study explores the diet and trophic position of *Carcinus* at sites along the York River using stomach content and stable isotope analyses. While plant and algal material was common, benthic invertebrates dominated. However, the relative abundance of clams, polychaetes, and crustaceans varied greatly among sites, variations likely due to differences in prey-community composition. Based on isotopic values of prey species, determined fractionation factors (1.4-2.60/00 and 2.5-2.90/00 enriched in  $^{13}\text{C}$  and  $^{15}\text{N}$ , respectively), and gut content data, I made predictions as to the origin of *Carcinus*' isotopic signature ( $\delta^{13}\text{C} = -15.4 \pm 0.3\text{‰}$ ;  $\delta^{15}\text{N} = 10.8 \pm 0.3\text{‰}$ ). These predictions supported results of other marsh studies, describing a generalized predator of benthic invertebrates, and therefore a potential diversion of energy from native benthic predators.

### **Education Panel**

Stacy Smith, Education

#### ***Influencing Educational Policy***

The Education Department presents a panel highlighting student research on educational policy in Maine and local school communities. In the fall semester students used Maine's Citizenship Education Task Force as a case study to explore policy changes to promote civic learning from kindergarten through higher education (K-16), including changes to the Maine Learning Results (MLRs), our core curriculum at Bates, and extracurricular approaches that promote youth voice and democratic values.

**Winton Black '07: *Bates General Education***

**Margaret Kinney '08: *Auburn Middle School and the Maine Learning Results***

**Kaitlyn McKechnie '06: *Edward Little High School Youth Voice and Diversity Day***

**Jemma Stromwick '06: *Task Force on Citizenship Education***

### **Erin Faulder '08**

Thomas Hayward, Classical and Medieval Studies

#### ***"Scipio's Dream": The Bond between Cicero's Politics and Philosophy***

Cicero's *De Re Publica* is a discourse written in the style of Plato's *Republic* about the ideal statesman as the caretaker for the ideal state. Curiously, the final section, frequently referred to as "Scipio's Dream," brings together his political ideas and his philosophical justification.

### **Mario Furloni '06 and Laura Tomaselli '06**

Steven Dillon, English

#### ***Film: Estranho, Estranho***

*Estranho, Estranho*, tells a story of brotherhood and loss through the consciousness between sleep. The film is eleven minutes long.

### **Katherine Gatti '06**

*See Sociology Panel*



### **Megan Germscheid '06**

T. Glen Lawson, Chemistry

#### ***The Interactions of the Non-coding RNA DsrA, the mRNA RpoS, and the Ribosomal Protein S1***

The stress response of *Escherichia coli* is mediated by the  $\sigma_s$  subunit of RNA polymerase. An important regulatory mechanism of  $\sigma_s$  translation and the stress response system in general is the interaction between the mRNA which codes for  $\sigma_s$ , RpoS, and the non-coding RNA DsrA. The interaction of the ribosomal protein S1 with both RNAs separately also has been seen. The possibility of the formation of a ternary complex among all three has been studied using native gel-binding assays while changing the concentrations of S1. The effect of renaturing the two RNAs together or separately also has been examined.

### **Marian Goddard '07**

Elizabeth Tobin, History

#### ***Four Memoirs of Hidden Girl Survivors of the Holocaust***

Jewish children in Europe were specific targets of Nazism because children represented the future of Judaism. Only six to seven percent of European Jewish children were left alive at the end of the Holocaust. The majority of these surviving children were hidden by gentile rescuers. The memoirs of hidden children are significant for constructing a complete Holocaust history because until recently, hidden children did not engage with their past. What are common aspects of how young girls hidden in Poland remember their hidden childhood? I found that the four memoirs I read identify invisibility and cravings for normalcy as common experiences of hidden girls. They also share a unique style, which simulates a child's voice, obviously influenced by an adult perspective.

### **Sam Golden '06**

John Kelsey, Psychology

#### ***The Role of Extracellular-Signal Regulated Kinase (ERK) in the Nucleus Accumbens on Nicotine-Induced Behavioral Sensitization in the Rat***

Drug abuse is believed to be enhanced via direct or indirect activation of the mesolimbic dopaminergic pathway originating in the ventral tegmental area (VTA) and projecting to the nucleus accumbens (NAc). For example, nicotine is presumed to exert its addictive effects by binding to nicotinic acetylcholine receptors on the cell bodies of dopaminergic neurons in the VTA. This action presumably mimics the effects of naturally reinforcing stimuli, essentially hijacking the normal role of dopamine neurons from coding proper reward prediction errors. However, the molecular basis of this process is not well understood. Recent evidence suggests that psychomotor stimulants such as cocaine are able to hijack the normal role of these neurons by elevating levels of the intracellular enzyme called extracellular-signaling related kinase (ERK) within dopamine neurons, possibly leading to the formation of detrimental neuroadaptations. However, the role of this protein in response-repeated chronic nicotine administration is unknown. To further elucidate the possible role of ERK in nicotine addiction, the effect of bilateral intracranial NAc infusions of the ERK-inhibiting drug U0126 on nicotine-induced behavioral sensitization was examined. It was hypothesized that these infusions would attenuate development and expression of locomotor sensitization, suggesting that the ERK signaling cascade within the NAc does play a vital role in the development of this behavior. However, no statistically significant effect of U0126 administration was observed and neither the acquisition nor expression of nicotine-induced locomotor sensitization was prevented. This may suggest an alternative mechanism for nicotine-induced locomotor sensitization, following a distinct molecular process as compared to other psychomotor stimulants. Research is currently ongoing to further validate or dispute this possibility.

**Joanna Good '06**

Kathryn Low, Psychology

***The Effects on Daily Physical Activity through the Use of a Pedometer-Based Motivational Interviewing Program within a Primary Care Setting***

Due to an epidemic of obesity, physical activity interventions programs are gaining widespread attention. The pedometer is a useful intervention tool for both motivating people to increase physical activity and for accurately measuring patterns of daily activity. The behavioral change technique of motivational interviewing (MI) has also been shown to increase physical activity and to raise retention rates in such intervention programs. Additionally, the primary care setting has been identified as an advantageous setting to implement these programs. This study recruited a sedentary population (N=29) at a local primary care practice and implemented an eight-week, pedometer-based, motivational interviewing program. This study looks at the short- and long-term effects of the program on daily steps, physiological factors, and energy and mood. Our goal is to build on the findings regarding pedometer programs, MI, and interventions in primary care settings by using a case-control approach to better understand the impacts of all three interventions on physical activity levels.

**Lisa Guy '06**

Kathryn Low, Psychology

***A Look at the Health Benefits of Art Therapy***

My poster presents a summary of my thesis on the therapeutic effects of painting, including a brief background of art therapy research and theory; a description of my painting experiment and findings; a summary of the implications of my research on using art therapy as an expressive tool; and samples of art work created.

**Megan Hamilton '06**

Robert Farnsworth, English

***Alice Munro's The Beggar Maid***

The development of author Alice Munro, as a writer hinges on her 1979 publication of *The Beggar Maid*. Stories from the collection, including "Privilege," "Simon's Luck" and the title work, "The Beggar Maid," brought Munro from being vaguely memorable to becoming an inimitable force on the literary scene. Much of that power comes from Munro's renewed engagement with her own memories and her subsequent impulse to consider her own narrative techniques and strategies. While the character of Rose may be fiction, Munro's stories illustrate much about the author's own dance with the past and her ultimate assertion of her own unique authority.

**Amanda Harrow '06**

Georgia Nigro, Psychology

***Interventions for Young Children Who Have Witnessed Domestic Violence***

Domestic violence has been identified as a national public health crisis, the leading cause of injury to women. Battered women are not the only victims of domestic violence, however. Although often overlooked, their children also suffer from such violence. In the United States, it is estimated that up to 10 million children witness domestic violence annually. Children exposed to domestic violence often experience emotional disturbances and are more likely to engage in violent or aggressive behavior in the future, yet relatively little attention has been dedicated to developing effective interventions or evaluating the existing interventions for these children. In my thesis, I examine the theoretical underpinnings and content of three intervention programs used with young children who have witnessed domestic violence. The thesis culminates in a set of recommendations for the local domestic violence agency where I have worked for the past two years.

**John Harvey '09, Christina Knobel '09, and Anna Levy '09**

Amy Douglass, Psychology

***Museum Lewiston/Auburn Brochures***

In the fall semester, 17 first-year students enrolled in First-Year Seminar 255 (The Psychology of Influence) and studied the psychological principles underlying social influence. They were given the task to redesign a brochure for the Museum Lewiston/Auburn, which specializes in preserving and exhibiting works from the Industrial Revolution. The task was not only to improve the aesthetics of the brochure, but to use what the students learned in class to produce a brochure that incorporates principles of influence to encourage visitors to come to the museum. Students incorporated such influence principles as authority, reciprocity, and scarcity to convey positive messages about the museum.

**Susan Hawes '08**

Patricia Buck, Education

***Lewiston Adult Learning Center and Bates College Collaboration: Public Health Curriculum for English for Speakers of Other Languages (ESOL) Classrooms***

Professor Patricia Buck, Zachary Risler '08, and I are working to develop a public health curriculum that can be used in ESOL classrooms at the Adult Learning Center in Lewiston. After meeting with people involved in different aspects of this project--including Bates professors doing research on the Somali population, and local hospitals and clinics who deal with patients who don't speak English—we decided to make videos for the classrooms. Our poster shows the process of our work, including information from interviews that contain past research related to public health issues for the ESOL population in Lewiston and our plans for the first video which is about dealing with an emergency. The poster features photographs of what we will dramatize in the video, including a car accident, 9-1-1 calls, arrival of rescue workers, and other steps related to dealing with an emergency.

**Meghan Helliessen '06**

Rebecca Fraser-Thill, Psychology

***From Buzzing Confusion to Jealousy and Empathic Concern: Reexamining Emotional and Social Development in Infancy***

The purpose of this study was to expand upon the developing findings that infants as young as six months old have the capacity to experience “nonbasic” emotions such as jealousy and empathy, by investigating these emotions in the presence of their peers. The current study examined the theoretical implications of infant interpersonal awareness through a triadic methodology whereby three infants were placed in a room together and observed through a one-way mirror. Statistical analyses on affect and gaze direction were run along with qualitative analyses on the overall group dynamic. The expected outcome, that infants will engage in social interactions and display forms of jealousy and empathy when it is evoked, has an immense theoretical impact on mainstream developmental theories. Further implications of the findings include the identification of emotional milestones and the implementation of early intervention methods for those infants who do not meet those milestones.

**Marie Hemmelgarn '06**

Michael Sargent, Psychology

***Cognition and Decision Making***

It is unclear to what extent decision making, particularly on difficult moral decisions, is driven by emotional or rational considerations. This study explores what factors may provoke a more normative or utilitarian response. The first experiment explores the role of cognition and reason by inducing accountability in subjects. Participants believe that they will need to explain their choices in an interview setting. It is expected that accountability will alter the frequency of utilitarian responses. The second experiment explores the role of group identity, in particular gender. The gender roles within the

questions participants must answer are manipulated so that, in making their decisions, the participants must choose whether to favor members of their own group. It is expected that when the utilitarian response favors the group that the participant identifies with, they will be more likely to select that choice.

### **Sarah Henderson '09**

Lavina Shankar, English

#### ***After Dinner: A Taste of Poetry***

I plan to read a selection of my recent poems, including "Photocopy," "October Dusk," "Departure," and "Portrait Memoir."

### **Keith Hengen '06**

Todd Kahan, Psychology

#### ***An Investigation of Retrospective Prime Clarification in the Retrieval of Newly Learned Information***

Center-surround theory and retrospective prime clarification describe distinct attentional mechanisms used to resolve inadequately activated information in semantic memory. This situation, similar to a tip-of-the-tongue phenomenon, can be induced in laboratory conditions when a prime and target consist of newly learned information. People are slower to categorize a target item that is related to a weakly activated concept in memory. Center-surround theory's explanation for this slowdown suggests that when attention is focused on a weakly activated piece of information, related information is inhibited so that the desired meaning stands out. In contrast, retrospective prime clarification attributes the delayed response to the process of disambiguating the prime using clues provided by the target. Previous research indicates that prime clarification offers a more parsimonious explanation of data generated in backward masking tasks. This study examined the role of prime clarification and center-surround inhibition in the identification and retrieval of newly learned information.

### **Bernard Herlyn '06**

Claudia Aburto Guzmán, Spanish

#### ***Cuban Exiles and Anti-Castro Groups***

The poster examines the history of Cuban immigration to the United States since the Cuban Revolution in 1959. For most Cubans, coming to the United States was supposed to be a temporary visit, as they desired to return to Cuba once Fidel Castro was removed from power. Throughout the 1960s and 1970's, Cubans came in waves to Miami and other parts of the United States. Numerous exile groups emerged in the 1960s to overthrow Castro and spread anti-Castro propaganda, including paramilitary groups, who staged violent attacks in Cuba and the United States. By the end of the 1970s, violent resistance decreased and political lobbying became the norm. During the 1980s the Cuban-American community became more autonomous as organizations like the Cuban American National Foundation gained political clout. Throughout this time, United States-Cuba relations soured, and a new wave of migration in the mid-1990s only helped to further this rift.

### **Tamotsu Hirai '06**

Paula Schlax, Chemistry

#### ***The Competitive Interaction of Sigma 32 with DnaJ, DnaK, FtsH and Core RNA Polymerase in Escherichia coli***

Sigma factors are subunits of the RNA polymerase and are crucial for the activation of gene transcription. Sigma factors are activated when there is an induction of an environmental stress. During temperature fluctuation,  $\sigma_{32}$  regulates the gene expression of the heat shock gene. When in vegetative growth,  $\sigma_{32}$  is bound to chaperone proteins, it prevents them from initiating transcription, but enables them to be degraded by a protease, FtsH. Evidence for interactions between  $\sigma_{32}$  with chaperones, core RNA polymerase as well as FtsH, is summarized and proposals to further characterize these interactions

are suggested. By understanding these interactions, there will be a better understanding of the competitiveness between the chaperones, FtsH and the core RNA polymerase. The major proposed question in this thesis is the identity of the proteins and their binding sites within the 632 as well as the interaction between the different sites. To further understand the regions within 632 where the competitive interactions take place, multiple tests were proposed.

**Tuyet-Mai Hoang '09, Khoa Pham '07, and Tien Tsan '09**

Czerny Brasuell, Multicultural Center

***VietAbroader Conference: Take Bates to the World, Bring the World to Bates***

A student-led admission diversity effort supported by the President's Office, the Dean of Faculty, the Dean of Students, the Multicultural Center, the Affirmative Action and Institutional Diversity Office, and the Office of External Affairs at Bates College. The VietAbroader Conference aims to motivate and train Vietnamese students, especially those from disadvantaged backgrounds to become competitive for admission into U.S. colleges. The conference's workshops on admissions, scholarship, essay writing, and testing are led by current college students.

**Emily Hoffer '06**

Lavina Shankar, English

***Made in Canada: Western Interpretations of Asian-Canadian Identity in Joy Kogawa's Obasan and Shani Mootoo's Cereus Blooms at Night through Homi Bhabha's "Third Space"***

In postcolonial cultural studies, Homi Bhabha's "third space" refers to a space for the construction and reconstruction of identity. Third space can be useful in understanding issues of cultural identity and the way identity is negotiated (or not) by Japanese/Canadian characters in the Canadian setting of Joy Kogawa's novel *Obasan* and "Wetlanders" on the imaginary island of Lantanacamara in Shani Mootoo's novel *Cereus Blooms at Night*. As Euro-American readers, we expect accepted characteristics to mirror those of the (our) dominant social, political, or religious factions. Yet it is important that we find a third space in literature where the Western reader negotiates and reconstructs what s/he will accept as "culture" to achieve an understanding of cultural difference. Through Homi Bhabha's creation of third space and interpretation of mimicry, I want to suggest that a third space within literature (Lantanacamara) is more useful than a historical, known (Kogawa's Canadian) setting.

**C. Colin Hollister '06**

Holly Ewing, Environmental Studies

***Heavy Metal Concentrations in Soil Surface Layers of Acadia National Park, Maine***

Atmospheric deposition falls in both wet and dry forms, and includes byproducts of emissions and other anthropogenic sources. Burning fuels in factories, motor vehicles, or emission of fine particles into the air from construction sites, tilled fields, and burning wood and refuse can mix these particles with the air and thus be carried long distances. These pollutants accumulate in soils far from their sources. Other researchers (Weathers, et al., in press) have created a model predicting the amount of atmospheric deposition falling throughout Acadia National Park. I used this model as a basis for testing how the accumulation of heavy metals in soils changes across a hypothesized gradient in atmospheric deposition. Additionally, I will examine how different soil characteristics influence heavy metal retention in soils. With the information gathered in this study, I can begin to understand the effects of air pollution on soil and the plants that grow in it.

**Seth Hubbard '06**

Beverly Johnson, Geology

***Lead Deposition over the Last 200 Years in Three Western Maine Lakes***

Lead deposition in lake sediments from midwestern coal burning power plants and leaded gasoline within the United States has increased steadily from the Industrial Revolution through passage of

the Clean Air Act in 1972. Since the mid-1970s lead levels in lake sediments have decreased slightly. In this study the lead concentration in sediment cores spanning the last 200 years was investigated from three Maine lakes: Tea Pond in Jim Pond Township, Basin Pond in Fayette, and No Name Pond in Lewiston. Tea Pond was thought to be the most pristine because it is the most distant from industrial activities and urban and residential influences. No Name Pond was believed to be the most polluted because it is located in an urban center with potentially more lead input from industrial and urban/residential sources. However, sedimentary lead levels were lowest at No Name Pond, and ranged from 5 to 67 ppm, and highest at Tea Pond and ranged from 3 to 128 ppm with noticeable peaks in the upper 10-15 cm of each core. These data do not agree with predicted ranges. This indicates that other processes in the basins play a large role in determining lead levels in sediments. This project uses both metal concentration data and organic matter to try to explain the differences in the lead levels between these ponds.

### **Charlene Impey '06**

Loring Danforth, Anthropology

#### ***Making Citizens, Making Soldiers: The Militarization of an American High School***

At Lewiston High School (LHS) and over 1,500 other American high schools, students walk the halls in military uniform and practice drill in the school's gym as part of their normal day as high school students and members of the Junior Reserve Officers' Training Corp. The JROTC, funded and created by the Department of Defense, is a military program designed for high school students. Critics of the JROTC claim that it is a recruiting strategy and a means for indoctrinating youth with military ideology. The Department of Defense refutes these accusations and argues that it is an academic program of civic education aimed at "motivating youth to be better Americans." My analysis of the JROTC focuses on how the discourses used in this debate position the JROTC in relation to LHS. Using Foucault's concepts of discourse, power/knowledge, and genealogy, I examine how the extension of modern disciplinary power to the military has intensified the process of militarization and enabled the JROTC to be "just another program" at LHS. The goal of this thesis is not to evaluate the JROTC, but rather to examine it as a form of militarization of American schools and citizenship.

### **Ross Ingham '06**

Krista Scottham, Psychology

#### ***Imitative Actions: The Effects of an Imitative-Based Curriculum***

Researchers have shown that human beings' imitative tendencies act as beneficial tools for survival. Theories such as, emotional contagion effect have laid out a framework for how and why imitation have positive effects (Howard & Gengler, 2001). Studies have shown that imitation leads to increased positive emotions and pro-social behavior (Van Baaren, Holland, Steenaert, & Van Knippenberg, 2003). However, this research has largely focused on adults and adolescents, overlooking children. This project expands previous research by looking at the educational and behavioral effects of imitation among preschoolers. Utilizing a three-week, imitative-based curriculum, I hope to harness children's imitative tendencies. The study is designed to answer two questions: 1) How does mimicry/imitation affect a child's learning ability? and 2) Can harnessing imitation improve the overall classroom environment?

### **A. D. Jacobson '08**

Rebecca Corrie, Art and Visual Culture

#### ***Conceptual Photography***

My latest work revolves around playgrounds and, more specifically, the jungle gym. I have taken pictures of twenty to twenty-five different jungle gyms, this series having sprouted out of a larger body of work composed of playgrounds and play spaces in general. Both bodies of work come from the question, "What is childhood?" This loaded question clearly does not have a simple answer. In this work, I provide a visual reference point from childhood, allowing the viewer to become engaged, to be

transported from the gallery into an imaginary space where he or she can draw on past experiences and memories in an attempt to look at this object from childhood, to isolate it, flip it around, and hold it up to the light to get a better view of it.

### **Anna Jarashow '06**

Krista Scottham, Psychology

#### ***Evaluation of a Women's Drop-in Center***

This program evaluation focuses on a local, faith-based, women's drop-in center. Through the utilization of participant observation and semi-structured interviews, the following questions were addressed:

1) Who attends the center? 2) Why? 3) What are the benefits of attendance? and 4) What programs could the center add in order to improve its services? Although the benefits of secular, non-gendered programs with a specific focus (e.g., drug addiction) have been well explored, less is known about the role that faith-based, women-only, general-use centers play within their communities. Findings from this research can contribute to the understanding of drop-in centers. In addition, the current project also could help one area center better serve the public need.

### **Margaret Joyce '06**

Robert Allison, Religion

#### ***When Nails Don't Hang: An Examination of How Jesus Hung on the Cross***

The tension between science and religion within modern society has illuminated the tenuous nature of various religious assertions. Forensic pathologist Pierre Barbet conducted medical experiments nailing cadavers to crosses to determine the cause of Jesus' death. His conclusions were that it was not anatomically possible that Jesus was nailed to the cross through the hands as represented in Christian tradition; and that the cause of death may have been bloodless – asphyxiation or cardiac arrest and shock. My poster presents Barbet's findings, along with archeological evidence and hypothetical diagrams to hypothesize how Jesus most likely was crucified.

### **Jordan Keeler '06**

Kathryn Low, Psychology

#### ***Female Sexual Dysfunction and Communication in College Relationships***

This study seeks to determine not only the prevalence of dysfunction among college-age females, both heterosexual and homosexual, but also to determine what role communication between partners plays in sexual function in young women. Participants are college-age couples both, heterosexual and lesbian (female genitalia), who have been together for at least four weeks and have had some form of sexual contact either together or solo. Participants were given two questionnaires, one being the Female Sexual Function Index and the other an Intimate Communication Disclosure Questionnaire. I believe that my results will show that the participants in the homosexual relationship will have a more accurate sense of their female partner's sexual function than the male in the heterosexual relationship. I also believe that if the first statement proves to be true that the homosexual partners may show fewer signs of female sexual dysfunction and possibly a higher level of communication between the couples than heterosexual couples.

### **Alexandra Kelly '09**

Sylvia Federico, English

#### ***The Technique of History: An Analysis of History of the Kings of Britain and Quest for King Arthur***

This paper is a discussion of the techniques employed by Geoffrey of Monmouth in his chronicle, *History of the Kings of Britain*, and director Don Campbell in his documentary, *Quest for King Arthur*, to achieve a semblance credibility and truth in discussion of the mythical history of King Arthur. Working eight hundred years apart, they accomplished this end through association with respected

historical sources and the matter of medieval Britain, and both also used the humility topos to win their audience's trust. In addition, each work uses the visual and narrative techniques available in its media to capture and hold that audience's attention, and to make it believe, perhaps in spite of its better judgment, in at least some element of the Arthurian legend.

**Margaret Kinney '08**

*See Education Panel*

**Caliandra Lanza-Weil '06**

Elizabeth Tobin, History

***Discovering Theatrical Performance during the Holocaust***

How could it be that people suffering starvation and forced labor of the Holocaust also put on plays? When discussing the Holocaust, most people bring up the unthinkable incidents the prisoners went through, including gas chambers and death marches. These horrific experiences are well documented and researched. My research focuses on a generally non-researched, but relatively common experience of Holocaust inmates: theatrical performance. In this presentation I discuss some of my findings from Holocaust diaries, memoirs and oral testimonies, attempting to answer questions including: What sort of performance occurred? Why did theatrical performance occur? What were the risks associated with the performances? Who participated in the performances? I also am interested in how memory plays a role in the different sources and I discuss how they function in my research.

**Rachael Levitz '06**

Lee Abrahamsen, Biology

***A Review of Juvenile Rheumatoid Arthritis: Why Methotrexate Is Still in Use***

Juvenile rheumatoid arthritis (JRA) is a common autoimmune disease that affects children younger than sixteen. The prevalence of the disease in the United States has increased in the last few decades. The recent completion of the Human Genome Project has allowed scientists to look at specific genetic factors that can be used as markers for diagnosing juvenile rheumatoid arthritis. As knowledge grows about the causes and progression of the disease, new drugs like Etanercept are being designed to target specific factors in the disease's pathogenesis. These new drugs can be compared with older drugs such as methotrexate, which broadly target central metabolic pathways in the body. Treatment for this disease is crucial because JRA is unpreventable. The outcome of JRA differs from patient to patient, but complete remission of all symptoms is only possible with the help of drug therapy.

**Andrea Lichtman '06**

Amy B. Douglass, Psychology

***Post-Identification Feedback: Manipulating Beliefs about the Number of Eyewitnesses and Measuring Credibility***

Misidentifications by highly confident witnesses are a leading cause of the conviction of innocent defendants. Inaccurate witnesses can be made confident by post-identification feedback suggesting that their identification was accurate (i.e., confirming feedback). An experiment was conducted to explore whether feedback affects some witnesses more than others. Participants were led to believe that they were either the only witness (solo identification context) or one of several witnesses (multiple identification context) viewing a video and making an identification from a target-absent lineup. Following their identifications, participants were given either confirming feedback or no feedback regarding their identifications. Participant-witnesses' responses were measured on testimony-relevant dependent variables including retrospective confidence. Results provide information about the potential for identification context to moderate the effects of feedback.



**Matthew Lipstein, '06**

Todd Kahan, Psychology

***Change Deafness: An Auditory Perspective on a Visual Phenomenon***

Change blindness is the finding that people often fail to notice rather large and obvious changes in their visual environment under a variety of conditions. Recently, an auditory analog to change blindness (change deafness) for speech showed that people are unaware of changes in speaker for spoken word lists (Vitevitch, 2003). Change detection studies for music, while they exist, have never explicitly examined change deafness. The current research attempted to answer the question: Does change deafness extend to musical stimuli? Participants listened to ten-second-long alternating versions of musical pieces, which were either identical or had a slight change in either tempo or instrumentation. Between the clips participants heard either silence or white noise. The results of this study help elucidate the way in which musical information is represented in the mind, and the types of changes that are, or are not, detected in music.

**Aliza Luft '06**

Elizabeth Tobin, History

***Memory and Gender in the Holocaust***

Holocaust diaries are essential to understanding how men and women experienced and reacted to the Holocaust. In *Women in the Holocaust*, Ofer and Weitzman identify four sources of difference in Jewish men's and women's Holocaust experiences. Ofer and Weitzman's resources consist mostly of memoirs and oral testimony from survivors. I argue that these do not offer the most complete picture, and that we must also look at diaries for more complete picture of how Jewish men and women reacted to the Holocaust because diaries are written in the present, as gendered experiences of the Holocaust are taking place. Memoirs and oral testimony, on the other hand, are apt to show signs of memory reconstruction, whether through forming collective or common memory. Through reading nine diaries and several articles on memory and gender, I conclude with a more finely nuanced understanding of how gender shaped men's and women's Holocaust experiences. In particular, I demonstrate how men's and women's responses to horrors of the Holocaust differ from Ofer and Weitzman's findings, and suggest that diaries ought to be included more frequently in such analyses.

**Hannah Lund '06 and Anne Whiting '06**

J. Roxanne Prichard, Psychology

***The Relationship between Sleep Quality, Mood, Stress, and the Cortisol Awakening Response (CAR) in College Women***

In college students, women are more vulnerable to stress and report lower sleep quality and more mood changes than men (Tsai & Li, 2004; Édell-Gustafsson, 2001). To explore the relationship between these factors in college women, we administered a survey to a random sample of Bates women (N= 263) measuring sleep quality, mood states, and stress. Using the response scores, participants were classified as good-, medium-, or poor-quality sleepers, and differences between these groups were analyzed with a one-way ANOVA. Our results showed that poor-quality sleepers report poorer academic performance, more frequent physical illness, and increased feelings of defeat as consequences of these problems. Additional studies examined the relationship between longitudinal measures of sleep, stress, mood, menstrual cycle, oral contraceptive use, and the cortisol awakening response (CAR); and the biological peak of the stress hormone cortisol thirty minutes after waking.

**Adam Macbeth '06**

Steven Dillon, English

***Film: Sad Robot***

A teenage bike courier suffers under the weight of his own affinity for popular culture. His reality starts to blur as he begins to understand himself as a character in a film. Frustration ensues. The film is forty minutes long.

**James Maldonis '06**

Paula Schlax, Chemistry

***Identification of Contact Points between Cross-Linked ncRNA DsrA and E. coli S1 Ribosomal Protein***

Under harsh environmental stress such as depleted nutrients or lack of oxygen, *E. coli* expresses a different set of genes than under normal conditions. This stress response is regulated by the rpoS gene, which is under the control of several factors including the small, non-coding RNA DsrA. DsrA interacts with the small 30S ribosomal subunit and S1 ribosomal protein, which causes rpoS to become activated. Understanding where S1 and DsrA interact is very important to further studying this system and the general gene expression *E. coli*. Utilizing ultraviolet cross-linking, affinity separation, and either an RNase or protease digestion, the contact points between DsrA and S1 can be determined.

**Megan Manning '06**

Anita Charles, Education

***Literacy in Multicultural Families***

Literacy is a social construct. What it means to be literate in one community could have no value or merit in another. The family and home play a critical role in the literacy development of young children. How do different cultures and their literacy traditions fit into the American definition of literacy? What are the challenges multicultural families in Lewiston face while trying to become literate according to mainstream American ideals? Framed by the lens of American cultural studies, and based on of a year-long service-learning placement at Even Start, a federally funded literacy center for low-income families, my thesis examines literacy in the context of multicultural families. I am specifically interested in the use of the storybook and storybook reading as a vehicle to promote literacy in multicultural families.

**Daniel Masterson '06**

Arlene MacLeod, Political Science

***Moving the Mountain: Small Community Development and Women's Empowerment in Mokattam, Cairo***

The Mokattam garbage collector community has long been one of the poorest populations in Cairo. Two private voluntary organizations have guided the community through significant growth and development since the mid-1980s. These organizations have upgraded technology leading to higher efficiency and safety standards; formed a microlending program for men, which failed; created a microlending program for women, which is a continuing success; raised health standards for the community and instituted health education for women; and formed a literacy, recycling, and job-training program for the women of Mokattam, which is the proudest achievement of the development projects. The failures and successes of the Mokattam programs are used by small-community development organizations around the world for the lessons they provide. I consider methods of poverty alleviation or poverty elimination these organizations in Mokattam pursue and whether they are effective in achieving their goals.

**Omar Maxwell '06**

Baltasar Fra-Molinero, Spanish

***The Evolution of Reggaeton***

The evolution of reggaeton traces the birth and rapid growth of the latest musical genre to take the world by storm, its influence on different populations, and its potential impact in the future. Using North American hip-hop, Jamaican dancehall, and a variety of Afro-Latino musical traditions from Latin America, this eclectic musical hybrid addresses many of the social, economic, and political issues facing people of color in today's world. In order to better understand the origins and impact of reggaeton's lyrical content and melodic rhythm, study of its beginnings and development is critical.

**Sarah Mazur '06**

Michael Retelle, Geology

***A Sedimentological Record of Climate Change in the Quendale Region of the Shetland Islands, UK***

The Shetland Islands, located between the Atlantic Ocean and North Sea, have a climate strongly influenced by ocean currents and storms. This study focuses around an archeological site called the Old House of Brow in the Quendale region of Shetland. This region has an excessive amount of sand supplied by beaches and windblown transport. Sometime in the seventeenth century, the Old House of Brow site was overlaid with nearly six feet of sterile sand. The large amount of sand transport that rapidly occurred at the site suggests a period of intense storminess. Local lochs may contain a sedimentary record of these storms in their stratigraphy, and several sediment cores were obtained from the nearby Loch of Brow during summer 2005. The cores have been analyzed to trace the seventeenth-century storm. Ultimately this study aims to connect significant changes in stratigraphy to changes in climate.

**Jacob McChesney '08**

Sylvia Federico, English

***Macbeth: The Man behind Shakespeare's Myth***

This thesis examines the reality of the Macbeth figure in Shakespeare's tragedy of the same name. The truth is sought in both primary and secondary sources, including those which spawned the tragedy itself.

**Kristin McCurdy '06**

Phaedra Upton, Geology

***Three-Dimensional Thermal Investigations of Acadian Tectonic Models Constrained by Geochronology in Central Maine***

Reconstruction of tectonic setting in Maine during the 423-385Ma Acadian Orogeny is controversial and deficient. A lack of collisional indicators such as ophiolites and blueschists forces researchers to interpret Acadian tectonics through more abstract deformational processes. Innovative constraints are obtainable through investigation of the thermal evolution evidenced by tectonic models in Appalachian literature. Two tectonic models with differing subduction geometries have been chosen and the thermal evolution of each is modeled using a three-dimensional code to solve the conductive and advective heat flow equation (FLAC<sup>3D</sup>). Within each geometric framework an asthenospheric wedge rises into the lithosphere resulting in widespread heating. The rate, depth, and size of the asthenospheric displacement, crustal uplift rates and exhumation are varied and the effect on the thermal evolution of each system observed. Resultant mid-upper crust temperatures are evaluated against the distribution of metamorphic isograds, and metamorphic and cooling ages from central Maine.

**Kaitlyn McKenchie '06**

*See Education Panel*

**Brooke Miller '07**

Alexandre Dauge-Roth, French

***Improving the Lives of Street Children in Senegal***

Although street children struggle to survive throughout the world, each country brings unique cultural reasons for children being on the street. While studying abroad, I spent a month discovering the realities of street kids in Senegal including why they are there and what can be done to improve their lives. After living with an NGO and learning about the lives of children and those who work with them, I found that urbanization, rural exodus, religion, and poverty are crucial to understanding the problem. As a solution, spreading awareness of the realities is important, especially artistically. This presentation explains the realities of what I found and plans for decreasing the number of Senegalese street children in the future.

**Noah Miller '06**

John Creasy, Geology

***A Mineralogical Study of the Sebago Batholith***

The Sebago batholith of southern Maine is the largest body of granite in New England. This thesis evaluates the crystallization history of the Sebago batholith using mineralogical methods. The minerals of the batholith are uniform in abundance, but variations in mineral chemistry exist across the batholith. For example, all samples contain orthoclase + plagioclase, but the assemblages show systematic compositional variation: Ca-richer plagioclase coexists with Na-richer orthoclase and Ca-poorer plagioclase coexists with Na-poorer orthoclase. Chlorite replaces biotite in many of the samples; this mineral reaction may serve as a geothermometer (Cathelineau and Nieva, 1985). Analyses of chlorite compositions yield temperatures for this reaction between 200 and 385°C in these granites. Muscovite incorporates varying amounts of Mg into its structure according to pressure, making it a useful geobarometer. Analyses of muscovite yield pressure estimates between 2.5 and 3.75 kilobars, indicating a depth of formation between 8.25 and 12.25 km.

**Erika Millstein '07**

William Ambrose, Biology

***The Effects of Commercial Baitworm Digging for *Glycera dibranchiata* on Intertidal Soft-Sediment Communities in Maine***

We examined the impact of commercial baitworm digging on the structure of two intertidal soft-sediment communities in mid-coast Maine. Experimental digging was performed by a professional baitworm digger, who used a standard worm hoe with 6 curved 20 cm tines and turned over 15 cm of sediment while removing *Glycera*. Four sets of paired dug and undug 5 x 10 meter plots at each site were sampled for fauna and sediment grain size at the initiation of the experiment, and then two, and four weeks following experimental digging. Samples for sediment pigments, porosity, and LOI (loss on ignition) were taken at the start of the experiment, and two days, four days, two weeks, and four weeks following digging. Despite several severe coastal storms, evidence of digging persisted beyond the final sampling. Preliminary data shows that there were no significant differences between dug and undug plots at one site during any of the sample dates. Similarly, at the other site no significant differences between dug and undug plots were apparent on the last sample date. A power analysis reveals that between 20 and 411 sample plots would be needed in order to detect a significant difference of 30% in the abundance of any species at 80% power on the last sample date at each site. The high intertidal where the experiment was conducted may be a highly disturbed area with species resistant to sediment disturbance.

**Nicole Moraco '06**

Rebecca Sommer, Biology

***Structural and Functional Effects of Prenatal Arsenic Exposure on the Developed Cardiovascular System***

Arsenic, particularly in the drinking water, is one of the greatest environmental toxins, exposing over 50 million people to arsenic levels above the WHO limit of 10ppb. Research shows that adult arsenic exposure can lead to cardiovascular diseases; no data exists for prenatal exposure. Fetal mice were exposed to sodium arsenate at 0, 10, 20, 40, and 80 ppm, via their mother's drinking water, from day five of gestation until birth. In adulthood, cardiac structure was assessed by histological staining to examine the presence of fibrosis. Basal and isoproterenol stimulated cardiac function was assessed by ECG analysis. No significant difference existed between groups for basal or isoproterenol simulated HR. On-going studies continue to evaluate the effects of prenatal arsenic exposure.

**J. Brooks Motley '06**

Michael Retelle, Geology

***Sedimentation in Linnévatnet, Svalbard, a Modern Process Study Using Sediment Traps***

This thesis examines modern sedimentation processes in proglacial Linnévatnet (Lake Linné), Svalbard, as part of a multi-faceted calibration study aimed at interpreting Holocene climate change in the region from the lacustrine sediment record. Staggered deployment of cone-type sediment traps for three different, but overlapping time periods over the course of one year allows for analysis of sedimentation on a seasonal basis. Sediment flux rates were determined based on dry mass. High resolution analyses of sediment grain size, mineralogy, and geochemistry reveal important spatial and temporal variations in sedimentation over the study period. These results are analyzed in the context of local meteorological conditions as recorded by a remote weather station. Total sediment flux and grain-size results are compared with those of a similar study on Linnévatnet in 2004. Variations between these two years, when related to differences in meteorological conditions, show important links between climate and sedimentation, which can be used to interpret the Holocene sediment record contained in the lake.

**Zachary Mueller '06**

Michael Sargent, Psychology

***The Nature of Male Competition***

This study addresses how evolution might have an effect on men's competitive nature. After being exposed to pictures of attractive or unattractive women, men participate in games to assess their level of competitiveness. It is expected that after viewing pictures of young, attractive women, men will act more competitively against male opponents than they after viewing older, unattractive women, or neutral stimuli. In addition, it is expected that, after viewing pictures of young, attractive women, men act less competitively with female opponents than they after seeing older, unattractive women.

**Nicole Nadeau '06**

Mary Rice-DeFosse, French, and David Scobey, Harvard Center for Community Partnerships

***Rooted in the St. John Valley***

I will present my French thesis, a compilation of interviews, photographs, and research from the St. John Valley. I focus on the Franco-American/Canadian culture and language through conversations with my own family and their experiences growing up in Northern Maine.

**Tanya Nauvel '06**

David Haines, Mathematics

***Independent Component Analysis, a New Way of Analyzing EEG Data***

Independent component analysis (ICA) belongs to a class of blind source separation (BSS) methods for separating data into underlying informational components of various types of data, such as images, sounds telecommunications, and in this particular case, in neuroimaging. Using electroencephalography (EEG), data was collected from a number of subjects who were taught to tap a particular sequence of musical rhythm, the goal being to find the relationship between the change in rhythm and the areas of the brain that are being activated. ICA is a novel method for analyzing EEG data. It is a mathematical modeling method used to decompose the signals into their original sources, using a variety of mathematical methods ranging from probability and statistics to linear algebra or information theory.

**Shaheen Nazerali '06**

Carol Dilley, Dance

***...In Progress***

This is a dance performance piece that I choreographed for Dance 251 (Dance Composition).

Dancers include Amber Harris '06, Mbali N'dlovu '09, Ana Nicole Rodriguez '09, and Irene Wood '09.

**Shaheen Nazerali '06**

Leslie Hill, Political Science and Women and Gender Studies

***Detention of Muslim Women in the United States***

The effects of post-9/11 detention of Muslims in the United States are severely underreported, and the little documentation that exists overlooks the gendered and racial constructions and implications of this detention. My presentation explores the effects of post-9/11 detention on Muslim women in the United States, examining the dynamic political and social identities of South and West Asian Muslim Women. The particular contexts considered include the conditions under which Muslim women have been detained, how gender produces these images and state actions, and what implications this holds for the immigration status of these women. My presentation discusses questions such as: How do gender and gender power-relations figure into the images of detention of Muslim men versus Muslim women? How does this detention (state action) then reconfigure gender and gender relations in U.S. Muslim communities?

**Katharine Nolan '06**

William Ambrose, Biology

***Evidence for Arctic Climate Change Based on the Growth Rates of Modern and Fossilized *Hiatella arctica* and *Mya truncata* from Svalbard***

Bivalves are useful in reconstructing environmental conditions in ancient and modern environments. We investigated modern and past climate in the Arctic during a period of climate change by comparing growth patterns of modern and fossilized individuals of two bivalves (*Mya truncata* and *Hiatella arctica*). Modern and fossil samples (carbon dated 2,000, 5,000, and 7,000 years BP) of both species were collected from Svalbard (78° N lat.). Presumptive annual lines in the chondrophore of each species were used to determine growth rates and inter-annual variation in growth. Preliminary analysis indicates that fossils have a slower growth rate than modern shells, suggesting that conditions have changed and current temperatures are warmer than 2,000-7,000 years BP. We also expect to see increased inter-annual variation in growth of modern compared to fossilized individuals resulting from modern increases in inter-annual variation in temperature.

### **Terence O'Connell '06 and Emily Rand '06**

Mary Rice-DeFosse, French

#### ***Franco-American Oral History Project***

We gathered research data from the personal histories of Franco-Americans (Americans of French Canadian descent) living in the Lewiston-Auburn area through video interviews. We recorded the interviews in an effort to capture not only the importance of the French language to local Francos, but also to document and preserve their rich identities and French culture. There are many Franco-Americans living in our local area although one would not be aware of this because of language loss that has taken place over the last half-century. We emphasize not the French language itself, but the histories of the Francos themselves. We are working in conjunction with the Franco-American Heritage Center in Lewiston, and an exhibition outlining our work will be on display at the center.

### **Ryan O'Connor '06**

Georgia Nigro, Psychology

#### ***How Much Money Buys Happiness? A Study of Adolescent Mental Health across Wealth Levels***

Through secondary data analysis of the National Longitudinal Study of Adolescent Health (Add Health) this study investigated the repercussions of certain parenting measures on adolescent adjustment indicators in different wealth classes. Classes were delineated according to annual household income; low-income (\$0 - \$20,000), middle-income (\$21,000 - \$100,000) and high-income (\$101,000 and up) groups were formed. Parenting measures included perceived parental achievement emphasis, isolation from adults, and perceived parental closeness. Adjustment indicators included substance use, internal distress, delinquency, and grades. Hierarchical regression and correlation analyses were run. Results demonstrated that a number of the parenting measures had significant associations with adolescent maladjustment in each wealth class. Results further demonstrated that parenting measures were most predictive of adolescent maladjusted behaviors in the high-income group, with models accounting for as much as 62% of variance versus 12% in the middle-income group and 26% in the low-income group.

### **Toshiko Odaira '06**

Karen Palin, Biology

#### ***The Effect of Cranberry Juice on the Biofilm Formation by Staphylococcus saprophyticus***

Biofilms, communities of microbes embedded in an organic polymer matrix adherent to a surface, may play an important role in the pathogenesis of infectious diseases. Recent research has suggested that biofilms may be involved in the development of urinary tract infection (UTI), the second most common infectious disease in developed countries. *Staphylococcus saprophyticus* is a major pathogen responsible for UTI in young women ages 18 to 24. As antibiotic resistance among uropathogens has increased, alternative treatments, including the use of cranberry juice are being explored. Catechin and proanthocyanidins, constituents of cranberry juice, have been shown to inhibit adherence of some uropathogens to host cells. The work presented here investigates the effect of cranberry juice on biofilm formation by *S. saprophyticus*, using an in vitro biofilm formation assay.

### **Meghan O'Dowd '06**

Helen Boucher, Psychology

#### ***Language and the Dialectical Self: An Extension of Cultural Priming***

A consensus is emerging in the field of cultural psychology that bicultural individuals, instead of replacing the knowledge structures of their native culture with those of their new one, retain both cultural frames, and that one or the other may become activated depending on the context. The purpose of this study was to activate these cultural frames in bilingual Chinese Americans with language, and see if cross-national differences in self-knowledge found in previous research would be replicated. It was expected that priming Chinese-Americans with a Chinese language questionnaire would cause shifts to more typically Chinese kinds of thinking (i.e., dialectical thinking) and lead to corresponding

shifts in the content of self-knowledge (i.e., more change, contradiction, and holistic elements), compared to Chinese-Americans completing the questionnaire in English, monolingual Chinese-Americans completing the questionnaire in English, and European Americans completing the questionnaire in English. Researchers discuss and explore implications of this research.

### **Brad Oriel '06**

John Kelsey, Psychology

#### ***Independent and Synergistic Modulation of Adenosine and Dopamine Receptors Improves Forepaw Stepping in a 6-OHDA Parkinsonian Rat Model***

Parkinson's disease (PD) is marked by the neurodegeneration of dopaminergic neurons along the nigrostriatal pathway. The objective of this study was to establish the therapeutic qualities associated with adenosine A<sub>1</sub> and A<sub>2A</sub> receptors. The selective dopamine neurotoxin 6-hydroxydopamine was administered unilaterally in the medial forebrain bundle to create a hemiparkinsonian rat model. Motor function was quantitatively assessed via forepaw stepping. Caffeine (15 mg/kg) and L-dopa (8 mg/kg) significantly improved stepping in the impaired contralateral paw, with L-dopa being more efficacious. Moreover, combining treatments improved stepping more than either drug independently suggesting a synergistic effect. In a second experiment, the selective A<sub>2A</sub> antagonist SCH-58261 (3.5 mg/kg) was found to improve stepping. In neither experiment was stepping normalized. Further experimentation will examine the effects of antagonists and agonists of the A<sub>1</sub> receptor. The present results support caffeine's action on A<sub>2A</sub> receptors and further indicate that combinatory treatment with L-dopa may provide synergistic benefits for improving the motor symptoms of PD.

### **John Pambianchi '06**

Susan Langdon, Psychology

#### ***The Effects of Social Support and Gender Differences in Motivation during the Recovery Process of Athletic Injury***

A total of fifty Bates College varsity athletes with an injury were asked to complete an online survey. The online survey involves questioning the process of their injury rehabilitation. Athletes were recruited by an announce email and by a handout from the Bates College athletic training staff. Motivation, social support, and demographics, including sport, gender, type of injury and severity of injury, were included in the survey. Correlations used to determine relationships between the social support of athletes and the motivations in recovery from injury. One-way ANOVAs used to test gender differences in these measures.

### **Lauren Perreault '06**

Michael Retelle, Geology

#### ***Mineralogical Analysis of Source Sediments to Linnévatnet, Spitsbergen, Svalbard: Implications for Late Holocene Climate Change***

Changes in the Arctic climate system during the late Holocene have fostered interest in the study of proxies that record long term variations in Arctic climate. Laminated lacustrine sediments contain records of annual deposition that can serve as valuable proxies for climate change. This study uses mineralogy to identify changes in the source of sediments entering Linnévatnet, a high Arctic lake in Svalbard, to examine climate change in the late Holocene. The climatically sensitive sediment sources include proglacial rivers, alluvial fans and solifluction lobes. Fieldwork (coarse fragment analysis, surface core and sediment sample collection) was conducted as part of the 2005 Svalbard Research Experience for Undergraduates Program. Source rock, surficial sediment samples and core subsamples are analyzed for mineral content by grain size fraction using x-ray diffraction. Changes in mineral composition and grain size down core are attributed to changes in sediment source and correlated to climate change during the last several centuries.



**Daniel Pitts '06**

Jennifer Koviach, Chemistry

***Synthesis of Disaccharides by Conjugate Addition***

Disaccharides are unique molecules found in a variety of natural products. One particular disaccharide, found in a potential anti-cancer agent, apoptolidin, was analyzed and a synthesis was attempted utilizing conjugate additions as key steps in forming glycosidic linkages. Other target disaccharides, found in different anti-cancer agents, were investigated as well.

**Lauren Pluchino '08**

Sawyer Sylvester, Sociology

***Breaking the Abuse: A Sociological Perspective on Family Drug Court Strategies***

While the issue of substance abuse is an ever present and ever emerging problem in our society, we must look at how family drug court programs work to break perpetuated cycles of abuse. Through analyzing the methods, means, and success rates of different family drug court programs, it is possible to see how this issue can be addressed and how sustainable change occurs. When looking at treating drug addiction within the confines of the court, it is important to work within our own social fabric and address the issue on many different levels. Using my experience working in the Lewiston District Court and my research concerning family drug court programs, I analyze how to break abusive cycles and advocate for reform.

**Allegra Poggio '06**

Amy Douglass, Psychology

***Conformity in Mock Jury Deliberations: The Impact of Task Difficulty, Defendant's Race, and Race Salience***

Various studies examine conformity among individuals in group settings. A particularly interesting venue to research conformity is jury deliberations. Jury deliberations are an essential component of the legal system. This study manipulated three variables in a case summary--task difficulty, race of the defendant, and race salience--and examined how those factors affect the subject's conformity in a mock jury deliberation. The study used a mock deliberation setting used in a previous study (Kassin et al., 1990). The experiment was designed in such a way that the participant read a case summary in which each of the variables mentioned above was manipulated. After the participant read the case, he or she wrote down a decision with a two-sentence explanation. After doing so, the participant was given five notes with the verdicts of the other participants. The experiment was set up so that the participant's decision would always be in the minority. After viewing the decisions of the other participant, the participant was asked to write down a second verdict. There were three rounds of deliberations. Conformity was assessed by the number of people who changed their vote in each condition.

**Hallie Preston '06**

Beverly Johnson, Geology

***Phosphorus Cycling in Gulf Island Pond***

The Androscoggin River, the most industrialized river in Maine, has a long history of poor water quality. In the 1960s, it was recognized as one of the ten most polluted rivers nationally. Since the passage of the Clean Water Act in 1972, Class C and Class B water quality standards have been met along the river except in two dammed sections, the deepest of which is located above Lewiston-Auburn called Gulf Island Pond (GIP). Phosphorus and total suspended solids are released regularly by the pulp and paper mills. Phosphorus stimulates algae blooms, thus increasing the amount of organic matter in the GIP. This organic matter increases the biological oxygen demand and reduces the amount of oxygen present for aquatic organisms. The purpose of this study is to seasonally measure total phosphorus

concentrations in Gulf Island Pond to increase our understanding of nutrient and phosphorus cycling in this body of water.

**Nathaniel Purinton '06 and Michael Wilson '07**

David Scobey, Harvard Center for Community Partnerships

***Sentimentalism and the Lewiston-Auburn Community: Representations of Life in a Mill Town***

As part of American Cultural Studies/History 390B (History in the Public Sphere), we attended the Lewiston play, *Lewiston: A New Home*, a romanticized version of Lewiston mill workers' lives, more specifically, the Franco-American experience in Lewiston. Interviews with community elders seemed to affirm a certain idyllic lifestyle during the mill era. While researching the history of the Franco-American community as part of an exhibit for Museum L-A, certain facets of community life did mesh with the play's themes; however, *A New Home* failed to comment on key issues such as class and social divisions within the Lewiston population. We discuss the numerous dilemmas we encountered when trying to create an exhibit retelling history in the public arena, including the difficulty reconciling the romanticized and realistic version of the Lewiston mill workers' experience.

**Catherine Reedy '06**

John Kelsey, Psychology

***Site of Therapeutic Action for Caffeine in an Animal Model of Parkinson's Disease***

Research has suggested that adenosine receptor antagonists are therapeutic in Parkinson's Disease (PD) either because of their interaction with L-DOPA in the dorsal striatum (direct pathway) or their inhibition of the overactive striatal-pallidal (indirect) pathway at the striatum and the external segment of the globus pallidus (GPE). To test for the primary therapeutic action of adenosine antagonists, we measured the behavioral effects of local infusions of caffeine, an A1, A2A, and A2B antagonist, into both the dorsal striatum and the external segment of the globus pallidus (GPE) in the forepaw stepping rat model of PD. Method: Unilateral injections of X ul 6-hydroxydopamine (6-OHDA) into the medial forebrain bundle (MFB) produced a rat hemiparkinsonian model in 20 Long-Evans rats. Caffeine (1 l of 1.0, 2.0, and 4.0 g/l or 1.0 l of 0.9% saline solution) was injected into the external segment of the globus pallidus (GPE) and then into the striatum through guide cannulas. The forepaw stepping test was the quantitative measure of motor performance and improvements. Results: When injected into the GPE, 2.0 and 4.0 g, but not 1.0 g caffeine improved stepping with the contralateral paw compared to saline ( $p < 0.0009$ ). Data collected on caffeine's behavioral effects when injected in the striatum, and we hope to examine the interaction of these central injections of caffeine with systemic L-DOPA. As the effects of these central injections of caffeine are larger than those of systemic injections, these data highlight the importance of the GPE in mediating these therapeutic effects of caffeine. A comparison of these effects to those produced by injections into the dorsal striatum important in indicating if the role of the GPE is unique. The need to understand where and how adenosine antagonists work therapeutically in PD is especially exigent as these drugs enter human testing and become a new line of monotherapy or are combined with L-DOPA.

**Marcia Reinauer '06**

Sue Houchins, African American Studies and English

***Film: Counter Clockwise***

Come see the short English senior thesis movie about Ethel's struggle with time travel. Written, directed, produced, and edited by Marcia Reinauer '06. Featuring Maggie McCally '08, Deborah Paley, David Hulbert, Sophie Hulbert, and Karen Ball. Narrated by Ross Ingham '06 Music by Maxwell Butler '06. Mnemonic Productions; rated PG; runtime 24 minutes.

**Jesse Robbins '06**

Lynne Lewis, Economics

***The Value of the Kennebec River Fishery Post-Edwards Dam***

My poster details the results from an economic valuation survey administered this winter by the author. Surveys were sent to approximately 1,500 anglers in Maine. The survey was partially designed as an ex-post estimate of dam removal benefits related to the Edwards Dam. We compare our estimates to the economic benefits estimates from 1991 (Boyle, et al.), which were used in the cost-benefit analyses that eventually led to the removal of the Edwards Dam in 1999. This project has especially significant implications, since in addition to providing an ex-post estimate of benefits, the results can be used in conjunction with other dam removal discussions such as those on the Penobscot. The project has also provided greater insight into anglers' perceptions and opinions of the Kennebec River, now that the Edwards Dam is gone.

**Ari Rosenberg '06**

Kathryn Low, Psychology

***Mindfulness-Based Intervention within College Students Identified as Feeling Depressed, Anxious, and/or Stressed***

Previous research has suggested that meditative mindfulness training may reduce mild symptoms of stress and depression. However, few studies have included adequate control groups. In order to examine the effects of meditative mindfulness practice on mild depression, anxiety, and/or stress, fifteen college students were randomly assigned to one of two groups. The intervention group participated in an eight-week mindfulness meditation program, including instruction and practice, while the control group was exposed to the concept of mindfulness through watching videos on spirituality. Levels of depression, anxiety, and stress were tested directly before and after the intervention. Results indicate that in the intervention group, there were fewer symptoms of depression at post-intervention than at baseline. Changes in the control group were not significant. In addition, males who completed the study had greater improvement than their female counterparts. Although initial results suggest that meditative practice is more effective than simple exposure to spiritual topics or mindfulness, follow-up data showed significant improvement in the control group. These results indicate that improvements can be maintained even after the program has ended, but that mediators benefit from regular meetings with an experienced teacher.

**Karl-Gustav Rueggeberg '06**

Stephanie Richards, Biology

***Inhibition of RSK 1 Activity by Aspirin, Salicylic Acid, Benzoic Acid, and the Overall Effects on Cancer Cell Growth***

Current cancer treatments such as chemotherapy, though effective in inducing cancer cell death, cannot distinguish between healthy cells and abnormal cells. This lack of drug specificity results in crippling side effects and possible death. Recent findings pertaining to the inhibitory effects of aspirin on cancer cell growth have prompted the scientific community to examine the nature of this drug in greater detail. In this experiment, the activity of RSK 1, an enzyme responsible for gene expression and cell survival is assayed upon exposure to a range of aspirin/aspirin derivative concentrations in order to explore whether aspirin can function as an anti-cancer agent.

**Kate Russell '06**

Ryan Bavis, Biology

***Chronic Intermittent Hypercapnia Does Not Alter Ventilatory Responses of Newborn or Adult Rats***

Acute and chronic exposures to intermittent hypoxia induce respiratory plasticity, but the effects of intermittent hypercapnia are less clear. This study examined the effects of chronic intermittent hypercapnia in newborn and adult rats. Rats were exposed to intermittent hypercapnia (7.5% CO<sub>2</sub>)

every other hour) for two weeks from birth (through P14-15) or as adults, after which acute ventilatory responses to 5% CO<sub>2</sub> were measured by barometric plethysmography. Baseline respiratory frequency and minute ventilation increased in P14-15 rats (P=0.02 and P=0.01 respectively), but differences were not significant when standardized to metabolic rate (P=0.67). In adults, baseline respiratory frequency increased after intermittent CO<sub>2</sub> (P=0.02), but changes in ventilation were not significant when standardized to metabolic rate (P=0.50). There were no significant differences in hypercapnic ventilatory responses between control and intermittent CO<sub>2</sub> exposed P14-15 rats (80±14% (mean±SEM) vs. 64±10% increase in minute ventilation; P=0.97) or adult rats (69±9% vs. 69±10%; P=0.99). We conclude that chronic intermittent hypercapnia has little effect on control of breathing in either newborn or adult rats.

### **Ryo Sakai '06**

Paula Schlax, Chemistry

#### ***Synthetic Non-coding RNAs and Translational Regulation of RpoS***

Small RNAs that do not encode polypeptides but are involved in translational regulation of specific genes in both prokaryotes and eukaryotes have been identified. In *Escherichia coli* (*E. coli*), translation of a global regulator for general stress response genes, known as RpoS, is regulated by small RNA, called DsrA. DsrA activates translation by base-pairing to RpoS mRNA and Hfq, an RNA chaperone protein, plays an important role in DsrA-mediated regulation in vivo. The presence of both DsrA and Hfq is necessary for a high level of RpoS translation. Vectors that encode different novel, synthetic non-coding RNAs were constructed to purposefully explore whether the effects of DsrA on RpoS translation require base-pairing between particular sequences of the two molecules. Any change in gene activation after induction of Hfq was determined by microarrays.

### **Elizabeth Santy '06**

Georgia Nigro, Psychology

#### ***Disney Princesses and the Female Stereotype***

This study examines which aspects of the female stereotype are most compelling for young girls. Because of their familiarity and popularity, the Disney princesses were utilized as examples of the current female stereotype. Young girls were told several vignettes about their favorite Disney princess. Some of these vignettes contained a physical deviation, some contained a behavioral deviation, some contained both of these deviations, some were taken directly from the relevant movie, and some were fabricated but contained no deviation of personality or appearance. The girls were asked to determine how likely their chosen princess would be to participate in the story read. Current psychological and women's studies literature suggest that the physical aspects are most important in the maintenance of the female stereotype. Thus, it was hypothesized that the stories containing physical deviations would be the hardest for the participants to connect with their princess.

### **Elizabeth Scannell '07**

Nancy Kleckner, Biology

#### ***Characterization of Glutamate Receptors in the Buccal Neurons of *Helisoma trivolvis****

Glutamate has been implicated in regulating the feeding central pattern generator (CPG) in the neurons of the buccal ganglia in the pond snail, *Helisoma trivolvis*. Application of glutamate agonists and antagonists to the buccal ganglia contributes to characterization of the inhibitory and excitatory glutamate receptors involved in the feeding CPG. Experimental solutions were perfused over the isolated central nervous system while electrophysiological recordings were taken from buccal neurons B27 and B19. Action potentials in B19 and B27 were inhibited by glutamate and excited by kainate, an excitatory glutamate agonist, indicating the presence of both inhibitory and excitatory glutamate receptors on both types of neurons. Preliminary evidence that quisqualic acid, an agonist for metabotropic glutamate receptors, inhibits B19, while DCG, an mGluR2 agonist, does not affect B19,

suggests that the inhibitory glutamate receptors are metabotropic, but not of the mGluR2 type. Further experiments are underway to verify the identity of these inhibitory receptors.

### **Jesse Schoonmaker '06**

Joseph Pelliccia, Biology

#### ***Nemaline Rod Myopathy and the Nebulin Protein***

Nemaline rod myopathy is a congenital neuromuscular disease that affected approximately one out of every fifty thousand live births. Afflicted individuals suffer from delayed motor development and general weakness in the arms, legs, trunk, throat, and face. The effects of the condition can range from relatively mild, demonstrating almost no outward signs of weakness, to very extreme, resulting in stillbirth or death immediately following birth—usually because of respiratory weakness. Diagnosis of the disease is only definite after biopsy and rod-shaped structures are visible in the sarcomere. Treatment for the disease is variable as phenotypic expression is greatly variable. There is no one cause of disease but it is estimated that 50% of people with NM have a mutation somewhere within their nebulin gene. Here is offered an in depth examination of the disease and one associated protein.

### **Alison Schwartz '08**

Sylvia Federico, English

#### ***Mary Queen of Scots: A Personification of Scotland as a Whole?***

Mary Queen of Scots has intrigued historians and students alike throughout history. At a young age Mary was sent to France, where she became the wife of the Dauphin at the mere age of fifteen. She lived most of her young life in France; however, her husband died was she was still relatively young. She decided to return to Scotland, instead of staying under the watchful eye of her stepmother. Some say that Mary personifies Scotland as a whole from her feminine nature, struggles with England, and problems with the English with religious reformers. Mary Queen of Scots is a figure of both mystery and intrigue. I intend to prove that by her nature and in her life she mirrors the struggle and character of Scotland in its entirety.

### **Katie Seamon '06**

Diane Haughney, Political Science

#### ***Texaco Nunca Más***

For my senior thesis I studied the Indigenous Rights Movement in Ecuador. In 1992 the indigenous people filed suit against Texaco for damages done to the environment and human health as a result of oil development. My poster display covers the history of the case and the effect that oil development has had on the people on the Ecuadorian Amazon.

### **Melissa Simones '06**

Georgia Nigro, Psychology

#### ***Gender Differences in College Aspirations***

This service-learning-based study investigated gender differences in college aspirations at Lewiston High School. The aspirations lab is used by students for college preparation and females used the lab at a much higher rate than males during the 2004-2005 school year. After reviewing past and current lab use, investigating college enrollment rates, and administering a questionnaire, it was evident that females were more likely to have higher aspirations, as well as a greater likelihood of attending college. These findings support national statistics that show females constitute a greater proportion of students enrolled as undergraduates.

### **Julia Simons '06**

Ryan Bavis, Biology

#### ***Hypoxic Ventilatory Response of Rats after Intermittent Hypercapnic Hyperoxia and Intermittent Hyperoxia***

Perinatal hyperoxia attenuates the hypoxic ventilatory response in rats by impairing carotid body development. This plasticity could be caused by developmental hyperoxic inhibition of chemoreceptor activity. Thus, we predicted that the effects of hyperoxia on the hypoxic ventilatory response could be reduced by stimulating chemoreceptors with CO<sub>2</sub> during hyperoxia or by interrupting hyperoxia with normoxia. Rats were raised in 60% O<sub>2</sub> for the first two postnatal weeks. One group was simultaneously exposed to intermittent hypercapnia (7.5% CO<sub>2</sub>) while another group was exposed to intermittent hyperoxia (21 and 60% O<sub>2</sub>). Hypoxic ventilatory responses were measured at 6 to 8 weeks by plethysmography. Rats exposed to hypercapnic hyperoxia exhibited 89% greater increases in ventilation (VE/VO<sub>2</sub>) to 12.5% O<sub>2</sub> than rats exposed to only hyperoxia (P=0.04), while rats exposed to intermittent hyperoxia exhibited 70% greater VE/VO<sub>2</sub> responses than rats exposed to hyperoxia alone (P=0.04). These data suggest that activity-dependent mechanisms contribute to hyperoxia-induced developmental plasticity.

### **Anna Skeele '06**

Georgia Nigro, Psychology

#### ***The Effects of Camp Images on a Person's Materialism***

Research on materialism shows that the use of media correlates with higher levels of materialism, which in turn correlates with lower well-being. In two different experiments, I sought to find out whether removal from the pressures of media and advertising would lead to a decrease in materialism. A week after completing a materialism scale, participants viewed scenic pictures of camp or comparable pictures of the built environment. They then filled out the materialism scale again. I hope to find that people who view scenes of summer camp have lower scores the second time they take the materialism scale, whereas people who view the control photographs of suburban scenes score similarly both times.

### **Sociology Thesis Panel**

Emily Kane, Sociology

#### ***Contemporary Social Issues: Sociological Perspectives***

In this panel, sociology thesis researchers address a variety of contemporary social issues: political apathy; the use of science in courts; humanitarianism among health care providers; the glass ceiling in employment; and workers' rights internationally. These issues are explored in the context of their connection to key social institutions including media, education, law, the health care system, employment structures, the family, and inequalities of gender, race, class and nation.

- **Kara Dietrich '06: *Political Apathy and the Mobilization of Young Voters: A Case Study of Rock the Vote's Use of Strategic Framing to Incite Political Participation***
- **Katherine Gatti '06: *A Critical Historical Analysis of Case Law and Commentary in Forensic DNA Admissibility***
- **Lucy Wall '06: *The Glass Ceiling Effect and Professional Development Use in U.S. Runaway Homeless Youth Organizations***
- **Ashley Wentworth '06: *Does the Name Matter or Are All White Jackets the Same?: A Comparative Analysis of the Humanitarian Attitudes and Behaviors of Osteopathic and Allopathic Physicians***
- **Kimberly Whipkey '06: *Jobs...Yes but with Dignity!'- Alternative Organization for and by Women: A Case Study of María Elena Cuadra***

**Rachel Sorlien '06**

Diane Haughney, Political Science

***Cultural and Political Conflict in the Construction of the Ralco Hydroelectric Dam, Chile***

I completed an independent study project while studying abroad in Chile. My senior thesis expanded on the same case study--the construction of the Ralco hydroelectric dam (1997 - 2004) and its consequences for indigenous peoples of the affected region. I interviewed families affected by the dam and members of several Chilean government agencies and in my thesis considered the possibilities for the Mapuche indigenous group to attain multicultural rights from the Chilean state in a political context of neoliberalism and limited democracy, using the Ralco dam conflict as a case study. My poster combines aspects of my primary source research in Chile, including photographs, and secondary thesis research.

**Nathaniel Stambaugh '06**

Matthew Côté, Chemistry

***Electron Waves in Nanoparticles***

In the last ten years it has become possible to fabricate highly symmetric structures called "nanoparticles." This term implies that the dimensions are on the order of one thousand times smaller than the width of a human hair. The interaction of these particles with visible light has many applications, so it is of fundamental importance to understand what is happening on the level of the nanoparticle. This poster presents a survey of models used to describe this behavior, including a model that describes a sea of electrons whose oscillations interact strongly with light.

**Mutiara Stillman '07**

Stephanie Kelley-Romano, Rhetoric

***Closet Masochists? Finding the Truth in the Alien Abduction Narrative***

One of the most notable articles pertaining to the alien abduction phenomenon is Leonard Newman and Roy Baumeister's "Toward an Explanation of the UFO Abduction Phenomenon: Hypnotic Elaboration, Extraterrestrial Sadomasochism, and Spurious Memories." Countless counter articles have been written, denouncing the idea that masochism is the true culprit behind the memories of supposed alien abductees. It seems logical--a legitimate response to a phenomenon that harbors no proof of its actual existence. Yet how can one even test a hypothesis without a realistic experiment? The lack of real evidence for the existence of extraterrestrial life makes a philosophical or psychological explanation very believable; however, there is not sufficient evidence to clearly show that all alien abduction narratives are based in sadomasochism. In my poster, I attempt to prove there is no such direct link.

**Andrew Stowe '06**

Ryan Bavis, Biology

***Vocalizations of the Saltmarsh and Nelson's Sharp-Tailed Sparrows: Correlating Social Interactions and Reproductive Stages with Changes in Singing Rate***

The Saltmarsh (*Ammodramus caudacutus*) and Nelson's (*Ammodramus nelsoni*) Sharp-tailed sparrows were recognized as a separate species in 1995. To improve our understanding of sharp-tailed sparrow behavior, I studied these birds' vocalizations during the breeding season at Atkin's Bay, in Phippsburg, Maine. Vocalization types, including a previously undocumented saltmarsh sharp-tailed sparrow song, were recorded. Environmental factors and the nesting stage, singing rate, and behavioral context of singing birds were recorded during set point-counts at sampling stations distributed evenly across the marsh. The song rate of the saltmarsh sharp-tailed sparrow's most common song tended to decrease with female reproductive stage advances, while that of the Nelson's sharp-tailed sparrow's primary song tended to increase. The latter of these two songs was also sung at different rates depending on counter-singing with other males. It is clear that two important factors affecting sharp-tailed sparrow singing are the social interactions between males and the females' reproductive stages.

**Jemma Stromwick '06**

*See Education Panel*

**Erika Tanaka '06**

John Kelsey, Psychology

***The Effect of Adolescent Nicotine Consumption on the Risk of Subsequent Adult-Onset Schizophrenia in an Animal Model***

Schizophrenia is a debilitating disorder characterized by positive, negative, and cognitive symptoms. Individuals with schizophrenia consume drugs with rates up to three times higher than those of the general population, and they are 4.6 times more likely to develop substance abuse disorders compared to healthy individuals. The self-medication hypothesis has been primarily used to explain the co-morbidity between schizophrenia and substance abuse. However, studies have also demonstrated that schizophrenics abuse drugs, particularly nicotine, before psychotic onset. Nicotine seems to exhibit greater drug effects among adolescents compared to adults, and therefore it is hypothesized that adolescent nicotine consumption may increase the vulnerability of an individual towards subsequently developing schizophrenia. Alternatively, individuals who are already vulnerable to schizophrenic symptoms may exhibit smoking behavior as a premorbid symptom. The goal of this thesis is to test these hypotheses by examining whether adolescent exposure to nicotine increases PCP-induced schizophrenic-like behavior in rats.

**David Thomazy '07**

Hong Lin, Physics

***Linewidth Narrowing by Optical Feedback in a Multi-Mode Vertical-Cavity Surface-Emitting Laser***

We have studied experimentally spectral characteristics of a multi-mode vertical-cavity surface-emitting laser that is subject to optical feedback. Appropriate alignment of the feedback mirror can suppress higher-order modes and significantly decrease the spectral linewidth of the laser.

**Lucia Tiererova '06**

Shepley Ross, Mathematics

***Strange Attractors behind Financial Market Returns***

The random walk theory of stock market returns has been the center of lengthy discussions in the finance community since its proposal at the beginning of the twentieth century. There are numerous empirical studies both in support and against this theory. While many extensions and modifications try to mend the errors in this theory, there is a growing need of an alternative theory. Indicators such as fractal statistical structure, long-memory processes, changing volatility, and positive Lyapunov exponents all point in the direction of chaos theory as a potential culprit behind the discrepancies between theory and empirical results. Methods for uncovering a complex equilibrium structure called a strange attractor will be described, and examples using data from real markets will be examined. I will illustrate why non-linear dynamical systems could help us understand modern financial economics better.

**Anne Tiernan '06**

Stephanie Kelley-Romano, Rhetoric

***Captivity Narratives and the Unknown Frontier***

As Americans, many of us tend to classify the unfamiliar using archetypal language. This presentation critically examines the captivity genre. I compare and contrast narratives of Indian captivity, alien abduction, and war captivity. I primarily focus on the similarities in language used to describe “the Other” within each genre of narrative. Typically when in a position of subordination in another culture or at an unknown frontier (e.g., the West during American expansionism, outer space, Iran), Americans tend to describe “the Other” as inferior or barbaric. They describe both the people and their practices as



substandard relative to Americans. There are often very strong parallels in the descriptive language used within the narratives genres. Further, I use the archetypal journey of initiation as well as the themes of capture, transformation, and return in each genre of captivity as foci for analysis.

**Danielle Touhey '06**

Karen Palin, Biology

***Effect of Cranberry Juice on Staphylococcus saprophyticus Urease Activity in Urinary Tract Infections***

Urinary tract infections (UTIs) are one of the most common infections in the United States, accounting for 7.3 million doctor visits per year. *Staphylococcus saprophyticus* is a uropathogen causing 42% of cases in women aged 16 to 25. Over the past two decades, uropathogens have developed resistance to many antibiotics and alternative approaches to treatment, including use of cranberry juice are becoming increasingly popular. Cranberry juice contains tannins and previous research has suggested that tannins inhibit extracellular enzyme activity. Urease is an extracellular enzyme which is believed to be important when *S. saprophyticus* establishes UTI. This work investigates the effect of cranberry juice on the activity of *S. saprophyticus* urease.

**Shannon Tully '06**

John Kelsey, Psychology

***The Effects of Nicotine on the Cognitive Symptoms of Schizophrenia in the Phencyclidine Animal Model***

Schizophrenia is a psychotic disorder characterized by positive and negative symptoms, and most notably, cognitive deficits. Phencyclidine (PCP) has been shown to produce many of these symptoms in humans and in animal models. This study determined if acute and chronic injections of nicotine would ameliorate the cognitive deficits produced by PCP in rats. Nicotine was implicated because of the number of schizophrenics who smoke (88%), suggesting that nicotine can improve cognitive function in schizophrenics, and, thus, the possibility that schizophrenics may be self-medicating to improve their cognitive functions. Eight male Long Evans rats were trained on a delayed non-match to sample (DNMTS) working memory task that required them to remember which of the two levers they initially pressed. Subjects were injected with 4.0 mg/kg and 5.0 mg/kg of PCP, and nicotine was administered acutely and chronically at 0.4 mg/kg. Results indicate that PCP significantly impaired performance on the DNMTS compared to saline injections, and that acute nicotine had no effect. I will also determine if chronic nicotine will improve performance compared to saline in rats with and without PCP.

**José Gabriel Tungol '06**

J. Roxanne Prichard, Psychology

***Melatonin in Treatment of Depression***

In order to establish the relationship between changes in melatonin and depressive affect, we will be comparing performance on behavioral tests of depression with plasma melatonin levels in a rat model of depression. The efficacy of photoperiod therapy and drug administrations will be analyzed within the context of depressive behavior and circadian modulation of melatonin. Specifically, the project aims are to 1) evaluate influence of three lighting schedules--short, long, and normal--on endogenous photopic and scotopic melatonin levels in depressed and non-depressed rats; 2) correlate depressive and anxiety behaviors in these lighting schedules with levels of melatonin; 3) evaluate and compare the influence of two drug therapies (SSRI anti-depressants and melatonin) on change in depressive and anxiety behaviors; 4) correlate these drug therapies with changes in melatonin levels in depressed and non-depressed rats; and 5) analyze the interactions between photopic and scotopic melatonin levels, drug treatments, photoperiod, and change in depressive and anxiety behaviors.

**Katharina Unger '06**

T. Glen Lawson, Chemistry

***Substrate Recognition in the Ubiquitin-Proteasome Pathway***

Essential to the survival of all organisms are mechanisms that control protein function and maintenance, as well as those that degrade proteins. The ubiquitin-proteasome system is one of several ways that degradation occurs: a protein is tagged by ubiquitin molecules and subsequently is degraded by a proteasome complex. In this project I will analyze the functioning of this system by measuring its ability to ubiquitinate proteins that need to be degraded. I will compare ubiquitination for proteins that have various N-terminal amino acids and either have a destruction box, a sequence of ten amino acids that signals for protein destruction, or do not.

**Lucy Wall '06**

*See Sociology Panel*

**Ashley Wentworth '06**

*See Sociology Panel*

**Kimberly Whipkey '06**

*See Sociology Panel*

**Eric Williams '06**

Stephanie Kelley-Romano, Rhetoric

***Birth Kills, Abortion Saves: Two Perspectives by Incongruity in Ridley Scott's Alien***

This paper applies Kenneth Burke's theory of perspective by incongruity to Ridley Scott's *Alien* (1979) in order to examine the relationship between the film's two radical metaphors. The alien is a radical metaphor for birth in that birth kills life, while the film's response to the alien—abort it—is itself another radical metaphor: abortion saves life. A comprehensive analysis of the alien birth metaphor also shows that both it and the entire film are carried out in the context of gender and genitalia, making the alien a sort of hybrid rapist who chases the spaceship crew through a world where horror and sex are so seamlessly intertwined that it makes *Alien* a grand sexual nightmare. The study shows how the film's radical perspectives reorganize the audience's perspectives without their awareness. It also begins to explain why, despite its radical perspectives, *Alien* remains one of the most successful horror films in history.

**Sarah Wilson '06**

Lynne Lewis, Economics

***A Hedonic Property Valuation on the Kennebec River: Did the Removal of the Edwards Dam Affect Property Values?***

This poster presents the results of a hedonic property value analysis of the Kennebec River Valley. Results are presented for seven different towns located above, below, and at the former Edwards Dam site. We have a very thorough data set of over 3,000 houses that were sold between 1997 and 2005; the Edwards Dam was successfully removed from Augusta in 1999. We used Geographic Information Systems software to create maps of the area and then geocoded the houses and found distances to the river and the former dam site. We include land-use data and look for effects of factors such as open space, housing density, and hazardous waste sites around the river. The ultimate goal is to see what effects the removal of the dam has had on property value in the area. Our hypothesis is that property value will go up after the removal of the Edwards Dam for houses located closest to the dam site. For houses further from the dam and from the river, we believe there will be less of an influence on their value.

**Andrea Wolf '06**

Baltasar Fra-Molinero, Spanish

***Aymara Textiles: Where Tradition and Modernity Meet***

After spending a semester abroad in Chile and initiating a study of the textiles of indigenous Aymara weavers in the *altiplano* and Lake Titicaca basin of the central Andes, I have been fortunate to return to this region and continue doing interviews and research. Through my travels, I have come to know their customs, the individual weavers, and the changes that modernity and globalization have made in their lives. My senior thesis in environmental studies has grown out of these experiences and focuses on the history, cultural ecology, and modern adaptations of the Aymara and their textiles.

**Oliver Wolf '06**

John Baughman, Political Science

***Voter Mobilization, Public Opinion on Abortion, and the 2000 Presidential Election Campaign***

Abortion attitudes have played a pivotal role in American politics throughout the twentieth century. The way abortion has been framed—whether women should have the right to intentionally terminate a pregnancy—has been a determining factor for American public opinion. Moreover, there is arguably a causal relationship between public attitudes on abortion and political activism. That causal relationship underlies the central focus of my senior thesis: to explore how, and to what extent, abortion attitudes mobilize citizens to vote and advocate for voting, using the 2000 presidential election as a case study. By presenting independently tabulated public opinion data, including tables and graphs on variables related to abortion, voter advocacy, partisanship, and religiosity, I demonstrate that abortion attitudes have a relative effect on heightened political activity. Furthermore, I show how the 2000 campaign's political context illustrates aspects of the political process when activity on abortion is particularly salient.

**Julie Yeterian '06**

Michael Sargent, Psychology

***Meaninglessness on the Cosmic Scale: Does Insignificance Salience Affect Defense of Cultural Worldviews?***

Based on terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) much research has established a causal connection between mortality salience--reminders of one's own unavoidable death--and a variety of methods of defending cultural worldviews, or socially created conceptions of reality. The present studies were designed to determine whether recognition of one's personal insignificance in relation to the immensity of the universe can also affect defense of cultural worldviews. Two studies were conducted to examine the difference in cultural worldview defense between participants who had been reminded of personal mortality, insignificance, or the experience of dental pain (control), as measured through 1) polarization in judgments of individuals who threatened or bolstered particular cultural worldviews; and 2) the explanation of stereotype-inconsistent and stereotype-consistent behaviors.

**Benjamin Yoon '06**

Nancy Kleckner, Biology

***Physiological and Pharmacological Characterization of Glutamate Receptors on B5 and B19 Buccal Ganglion Neurons of *Helisoma trivolvis****

Gastropod mollusk feeding is directed by a cyclical pattern generating neuronal circuitry. The snail, *Helisoma trivolvis*, feeds in three phases, and three distinct interneurons in the buccal ganglion control each phase of feeding. Glutamate appears to be a primary signaling molecule for some of these feeding interneurons, and previous evidence suggests the presence of both excitatory and inhibitory receptor populations on the follower neurons (B5, B19). In this project, these unidentified receptor populations are being studied by isolating B5 and B19 neurons from *Helisoma* buccal ganglia, and recording

response to glutamate and other receptor agonists in the presence and absence of pathway inhibitors. These experiments will contribute to our knowledge about receptor types responsible for the control of mollusk feeding by glutamate.

**Jin Zhang '06**

T. Glen Lawson, Chemistry

***Evaluation of the Role of the N-terminal Amino Acid in HAV 3C Protease Susceptibility to Ubiquitination***

The ubiquitin ligase E3-alpha is part of the pathway for selectively targeting N-end rule protein substrates for ubiquitination. Typically characterized as having basic or hydrophobic N-terminal amino acids, these proteins are subsequently degraded by the 26S proteasome complex. We have shown that while the HAV 3C protease lacks a destabilizing N-terminus, it is recognized by E3-alpha via an internal destruction signal of ten amino acids. To further understand E3-alpha-substrate interaction, we have evaluated the effects of a mutated HAV 3C protease N-terminal amino acid on 3C protease susceptibility to ubiquitination. We measured the inhibitory effects of purified N-terminally mutated HAV 3C protease proteins on the ubiquitination of radio-labeled wild type 3C protease in an in vitro system. Findings from preliminary studies suggest that while mutating the 3C protease N-terminal serine to phenylalanine does not affect ubiquitination susceptibility, 3C protease with an N-terminal serine to arginine mutation is a better substrate for ubiquitination than the wild type protein.