



Abstracts

9:30 -10:40

Literature and the Arts**Two Romantic German Chamber Music Works (performance)**

Julia Lovett '04, *English*, Lauren Prusiner '04, *English*, Lenna Onishi '06, *Biological Sciences*, Laura Case '06, *Arielle Galambos '06*, and Heather Hauslauden '07
 ADVISOR: Nancy Cirillo, *Music*

Chamber music requires the active and intimate collaboration of a small number of musicians. Ludwig Van Beethoven, although most widely known for his colossal symphonies, turned often to this unique genre to produce some of his most beautiful works. The Trio in B-flat, op. 11, was originally composed in 1797-78 for piano, violin or clarinet, and violoncello. Its exuberant first movement gives way to a tender, lyrical second movement, and finally culminates in a charming set of variations.

An example of Schumann's mature romantic style, it has been said that the Quintet in E-flat major for Piano and Strings is the greatest of Schumann's chamber music works. The Piano Quintet stands as the first important work in musical history written for a string quartet with piano and features a powerful finale culminating in a double fugue based on themes from the first and fourth movements.

Julia Lovett, *piano*
 Lauren Prusiner, *violin*
 Lenna Onishi, *violoncello*
 Allison Kao, *violin*
 Amy Ngan, *violin*
 Laura Case, *viola*
 Arielle Galambos, *violoncello*
 Heather Hauslauden, *piano*

Modernity and Tradition (paper session)**I Don't Feel Quite Myself: The Effect of London on Individual Identity**

Tiffany Tsao '04, *English*
 ADVISOR: Lisa Rodensky, *English*

As a center of trade, of government, of culture, of industry, and of a sprawling global empire, the London of the early twentieth century drew in people not just from the rural areas of England but from other nations as well. All aspects of British life seemed concentrated within the densely packed city, affirming the coherence of a certain nation and civilization. But for one living in London among so many other individuals, metropolitan life presented a challenge to the coherency of oneself. In Joseph Conrad's *The Secret Agent*, the individual must struggle against becoming one with the faceless multitude, while in Virginia Woolf's *Mrs. Dalloway*, one's identity may even reside within others rather than within one's self. I will be looking at how these two works call into question the very nature and essence of individual identity in the face of modern urban life.

Sound and Sense in Native American Literature

Summer B. Zeh '04, *English*
 ADVISOR: Lawrence Rosenwald, *English*

"In the house made of the dawn / In the house made of the evening light," are among the most beautiful lines of poetry and are also from the Navajo Nightway. A growing interest in Native American literature is leading to a growing number of questions about how to understand that literature. What is orality? How do we deal with orality and performance in literature? What are the differences between hearing and reading? How do authors put oral traditions on the page of a novel? What can new examinations of literature teach us about our old approaches to literature? In the context of all these questions, how is Native American literature to be translated? Answers to these

questions come through examination of many different types of Native American literary material. This presentation will focus primarily on oral narration, with some examples from audiotapes, and on the important aspects of how oral literature is heard.

Don't Hate Me Because I'm Beautiful: Observations of Aesthetics and Meaning

Leah Morse '04, *Cinema and Media Studies*
 ADVISOR: Patricia Berman, *Art and Martin Brody, Music*

Have traditional "aesthetics" been abandoned in twentieth-century art and concert music to be replaced by "meaning" and ideas? Justifications of dissonant atonal music range from an almost overwhelming desire to break away from the nineteenth-century giant composers to reacting to oppressive censors and overly political ideas of what music is supposed to be. Abstract art is supposed to be aggressive, satirical, chock full of theory, and most importantly, stare the viewer in the eye and demand a response, if not full physical participation, instead of a passive stare. Are "aesthetics" out and "meaning" in? Or have we simply redefined what aesthetics are in the twentieth and twenty-first centuries? Are we resisting the new because it is unfamiliar and difficult? Or will the new one day become old, only to leave everyone wondering where we thought the absence of beauty was all along?

Performing Blackness: The Cultural Politics of Spoken-Word Poetry in Boston

Crystal Fleming '04, *Sociology and French*
 ADVISOR: Thomas Cushman, *Sociology*

Unbeknownst to many social scientists, a vast, transnational network of performance poetry has emerged over the past two decades and inspired a renaissance of grass-roots cultural production. This resurgence in public poetry and expression has become widely known as the "spoken word" movement. The popularity of spoken word is inextricably linked to the

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development of SLAM poetry (the competitive art of performance poetry).

Slam poetry and open mikes are cultural modalities that are particularly charged with social and political ideology.

Increasingly, the stage has become a vibrant sector of civil society and a safe space to confront issues of gender, race, and sexuality. This presentation is based on my honors thesis, which examines the structure and function of the spoken word scene within Boston's African American community. Through participant observation and interviews with the poets themselves, I explore the sociological dynamics of spoken word poetry within the context of the African and European oral traditions. (Research supported by the Schiff Fellowship and the Mellon Mays Minority Fellowship.)

Science and Technology

A Big Eye on the Sky (panel)

Giuliana Funkhouser '04, Japanese, Brianna Knight '06, Spanish and Environmental Studies, Rachel Hock '06, Carolyn Schultz '04, Political Science, April Stimson '06, Morgan P. Carberry '04, French, Melissa Rice '04, Astrophysics, Rebecca Stoll '05, Laura Faulkner '06, American Studies, and Sarah Rettger '04, Latin American Studies
 ADVISOR: *Kim McLeod, Astronomy*

As students of Astronomy 206, we have learned to operate Whitin Observatory's 24-inch telescope. We will describe our use of the astronomical digital camera to produce a gallery of color images and to carry out research. This year's projects include measuring the light curve of near-Earth asteroid Hermes; determining the shape and motion of a comet; finding the distance and age of an open star cluster; observing an eclipse of a binary star; tracing star formation across a galaxy's spiral arm; and probing the structure of a galaxy.

Stressed Out? So Are Our Bacteria (panel)

Characterization of Heavy Metal Resistant Bacteria Isolated from Paintshop Pond

Tina Wang '04, Sociology
 ADVISOR: *Mary M. Allen, Biological Sciences*

Chromium and lead are toxic to organisms even in small amounts. The former Henry Wood's Sons Paint Factory used heavy metals as paint pigments and contaminated the area surrounding Paintshop Pond in Wellesley. Bacteria were isolated from soil samples. Isolates were stained and analyzed by light and electron microscopy. Bacteria were found to survive on chromate concentrations up to 9.0mM and on lead concentrations of up to 1mM. Many of the isolates were found to survive in both anaerobic and aerobic conditions. Gram stains showed both Gram positive and negative bacteria, and both cocci and rods were present. Electron microscopy showed the presence of pili and capsules. No plasmids appear to be present. Antibiotic tests suggested that heavy metal resistance may not necessarily confer antibiotic resistance. Atomic absorbance spectrometry indicated chromate was present in trace amounts in the bacteria. (Research supported by the Howard Hughes Medical Institute.)

The Ins and Outs of Nitrogen in Cyanobacteria

Christina Chae '06, Sogole Moin '05, Biological Sciences, Deborah Park '06, Valerie Riguero '06, Jane Rodgers '06, Neuroscience, Cassidy Sutton '06, Linda Trapani '06, and Debbie Waung '06
 ADVISOR: *Mary M. Allen, Biological Sciences, Nancy H. Kolodny, Chemistry, and Adele J. Wolfson, Chemistry*

Cyanobacteria are ancient organisms, able to survive under many stressful conditions, including nitrogen deficiency. They accumulate nitrogen in the storage polymers phycocyanin and cyanophycin. To understand the mechanism of nitrogen storage in cyanobacteria we have

examined several steps in nitrogen metabolism. Two strains of cyanobacteria were grown after nitrogen stress to identify at what point phycocyanin, a molecule involved in light harvesting, is synthesized. These strains were also regrown in 15N after nitrogen stress so that NMR spectroscopy could be used to determine whether the phycocyanin is made with nitrogen from within the cell or from the external medium. Utilization of some nitrogen sources requires the conversion of nitrate to ammonium. To determine at which point this pathway is activated, the activity of the enzyme nitrate reductase was measured after cells were grown under nitrogen starvation conditions and refed. (Research supported by the Howard Hughes Medical Institute.)

Protein Analysis and Acid Stress Responses in the Cyanobacterium *Synechocystis* sp. strain PCC 6803

Jing Chen '05, Biological Chemistry and Tam-Linh Nguyen '04, Biological Sciences
 ADVISOR: *Mary M. Allen, Biological Sciences*

The use of gel electrophoresis and autoradiography determined the proteins that are synthesized by *Synechocystis* sp. strain PCC 6803 at alkaline conditions. Various breakage techniques separated the proteins from the soluble fractions. The FOCUS technique had the best ability to separate whole cell protein, which were mostly low molecular proteins. Previous studies have shown that when cells of 6803 are transferred to pH 4, they survive and the pH of the unbuffered medium shows an immediate rise above pH 6. It was hypothesized that cells may be excreting a substance that causes a rise in pH. Colorimetric ammonium assays performed on the medium of acid stressed cells showed an increase in ammonium concentration over time. Organisms that possess an ATR are able, after a mild or moderate pH shock, to survive extreme pHs. Results of ATR experiments suggest that 6803 lacks this survival mechanism. (Research supported by the Howard Hughes Medical Institute, NSF AIRE, and NIH AREA grant to Dr. Mary Allen.)

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Social Analysis**Free Trade Goes to Broadway
(performance)**

Yelena Biberman '04, International Relations, Divya Daryanani '05, International Relations, Ursula Jessee '05, Chiaki Nishijima '04, International Relations, Bonnie Sit '05, International Relations, and Julia Powers '05, Psychology

ADVISOR: *David L. Lindauer, Economics*

What do Scrooge and the World Trade Organization (WTO) have in common? Is there really a free-trade fairy? Explore pro free-trade arguments with a creative twist. Learn about two international trade disputes involving the United States over folding gift boxes from China and soft-wood lumber from Canada. Hear perspectives from Adam Smith, David Ricardo, Paul Krugman, and Scrooge. They will help explain how fair is fair trade; who loses and who gains from protectionism; and what is antidumping. Economics 212 students transform hundreds of pages of bureaucratic jargon into a dramatic performance on these questions and more.

**Empirical Analysis of Social
Phenomena (paper session)****Affluent Affordability: Analyzing
MGL. 40B**

Margaret M. MacDonald '04, Economics
ADVISOR: *Karl E. Case, Economics*

In addition to securing employment, many college graduates face the onerous task of finding an affordable place to live. In Massachusetts, housing prices have soared since 1980 and usually only the wealthy can afford to live in the eastern part of the state. In 1969, The Commonwealth of Massachusetts passed a law (MGL. 40B) in an effort to increase its stock of affordable housing. Steeped in controversy, 40B, the "Anti-Snob Zoning Law," addresses a dire need but has also raged battles in the backyards of many Massachusetts communities. Is this suburban brawl

worth it? Are there better alternatives?

This presentation summarizes a semester-long independent study about 40B and its effectiveness. Special attention is paid to whether or not the presence of affordable housing devalues neighboring property values.

**What Goes Up Must Come Down. Is It
True for Environmental Degradation?**

Abigail Tinker '04, Environmental Studies
ADVISOR: *Elizabeth DeSombre, Political Science*

Recent economic studies have suggested that some indicators of environmental quality will initially worsen as income per capita in a country increases but will turn around and improve as the country continues to get richer. The so-called Environmental Kuznets Curve (EKC) theory has been used to support economic growth policies in developing countries, but little is known about how the environmental quality in a single country is affected by economic growth. My thesis research on this topic first looks for the existence of EKCs through an empirical analysis. Then, I further analyze the relationship between income per capita and environmental quality in several individual countries. Understanding the relationship between economic growth and the environment in a country is necessary to create sustainable policies on both the national and international level.

**Political Communication on the Internet:
Campaign Web Sites of the
Congressional Candidates in 2002**

Meredith Laitner '05, Political Science and Economics

ADVISOR: *Jeff Gulati, Political Science and Winifred Wood, Writing Program*

The Internet is becoming an increasingly important forum for political campaigning; it provides candidates with a new, low-cost way to communicate with the public and mobilize possible supporters. This research examines the campaign Web sites of the candidates who ran for Congress in 2002 and had a presence on the World Wide Web. The home page of

each site was examined for its general tone, electronic features, voter information, and images. Data are combined with information on the candidate's previous political experience, campaign funding, and potential constituency. Findings from the content analysis indicate that having a Web site is influenced by the candidate's party affiliation, gender, political experience, financial resources, electoral competitiveness, and constituency education level. A candidate's gender and political experience also influence the specific electronic features chosen for the site's home page. This research is important because of its implications for whether the Internet will succeed in "leveling the playing field" for all candidates, and whether it will serve to increase voter awareness and participation. (Research supported by NSF Award for the Integration of Research and Education.)

**Voices in Literature and Medicine: In
Medias Res (panel)**

"We've got to live. No matter how many skies have fallen." – D.H. Lawrence

In Literature and Medicine, we studied the physical and emotional aspects of illness, patient-doctor relationships, and societal views of medical professions and we were faced with the task of creating a project examining a specific aspect of these broad issues. Although the original purpose of our studies was to expand our understanding of our selected topics, i.e. suicide, anorexia, and the medical profession, through research our projects transformed into records of our journeys, documenting how we made peace with these issues. Brought together by the course and by our common experience of personal reconciliation during research, writing, and introspection, we will present the knowledge we acquired and the personal experiences that shaped our views.

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The Severity of True Anorexia*Florence Graham '06*ADVISOR: *Michèle Respaut, French*

Although many people think of an anorexic as someone who simply skips meals and who seeks absolute control, an individual ill with anorexia suffers from a disorder that even the doctors of today often fail to cure. The presentation will deal the complexity of the suffering of the patient, the effect the patient has on those around her, and overcoming the loss of a loved one.

The Breaking Point: to Let Go, to Hang on, for a Mind at Peace*Kelly Sheridan '06*ADVISOR: *Michèle Respaut, French*

Humans, just like all other forms of life, instinctively seek to survive. While innately averse to their own extinction, some people make the decision to choose death over life. The reasons for suicide are just as varied as the colors in a rainbow, but regardless of “why” they did it, the outcome is always the same. The sense of loss, regret, and the “what ifs” torment those who continue living. In some way or another we have all been touched by suicide and have had to cope with the heartbreaking aftermath. “Wars come and go, but suicide, thus far, has stayed.”

Examining Doctors and Medicine*Victoria Lyo '05, Chemistry and Biological Sciences*ADVISOR: *Michèle Respaut, French*

Medicine is not just a profession; it is a life’s dedication. Some individuals resolve early on as dreaming children to become doctors. For others including myself, deciding to become a physician can be as difficult a task as actually completing one’s medical training. My project aimed to answer the question: how and why do individuals and specifically Wellesley students decide to become doctors? Why would one want to become a doctor when doctors are constantly faced with death? By surveying premedical students at Wellesley, examining research studies about factors influencing the formation of medical career aspirations and current trends in medical students’ career choices, and sifting through my personal writing and experiences, I elucidated motivations behind the pursuit of medicine and clarified my own reasons to become a physician. I hope to share with the community both my personal experiences and my research findings to help Wellesley students in their career decision processes.

Behind the Scenes of a Supreme Court Case (panel)*Tracy Gwendolyn Bassett '06, Political Science and Spanish, Sophie Kim '06, Political Science, and Erchen Yan '05, Economics and American Studies*
ADVISOR: *Lori A. Johnson, Political Science*

Each participant in this panel investigated the background of a major United States Supreme Court case. Specifically, we read the lower court opinions in the case, the briefs of the parties, listened to the oral argument before the Supreme Court, and researched the people involved in the case. Our presentations will address how the legal case changed and progressed before being addressed by the Supreme Court, how our own impressions of the case changed, and what particularly resonated with us as we learned more about the prior history of the case. Cases discussed include challenges to racial discrimination in the administration of the death penalty, restrictive abortion laws, and drug testing of high school students.

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Literature and the Arts

**Changing Minds/Reading Minds:
Printing on Alternative Surfaces and
Pushing Boundaries (exhibition)**

Angela Chen '04, Architecture and Emily Stokes '05, Studio Art and English
ADVISOR: *Katherine McCannless Ruffin, Book Arts and Phyllis McGibbon, Art*

Historically, printmaking has been used as a means of disseminating information and promoting communication. Since its earliest stages, artists have expanded upon the idea of printing by using a variety of forms, text, and technical new advances to express their ideas. Working in collaboration with four other schools around the country, we have come together to comment on issues related to politics, culture, history, and identity in a portfolio organized for the 2004 Southern Graphics Council conference. This exhibition presents our work in response to the theme, "Changing Minds/Reading Minds."

**Beethoven String Quartet op. 59
no. 2 (performance)**

Jonina Allan '04, Music, Allison Lee '06, Linguistics and Cognitive Science, Madeleine Baverstam '07, Music and English, and Jennifer Chen '07
ADVISOR: *Nancy Cirillo, Music*

This Beethoven string quartet, written in 1806, was dedicated to Count Andreas Razumovsky. Although the piece is cast in a terse E minor, it embodies the heroic quality of Beethoven's compositions during this period of his life. The quartet commences with two chords that leave listeners suspended with no resolution. These chords reappear throughout the movement in various dynamics and keys. In the second movement, Beethoven drastically alters the mood. The opening chorale-like theme evokes a very expressive, subtle intensity, while the punctuated rhythm of the beats produces a constant sense of forward movement. The allegretto has a playful character. At

times, the beat is rather unstable, suggesting a feeling of imbalance. The middle trio consists of a Russian theme from a collection of Russian folksongs. The grand fourth movement launches off in a shocking C major key. As it sways from C major to E minor throughout, this brilliant, romping movement has a high-spirited theme. Yet at times, it is challenged with erratic phrases incorporated between the four voices. In the coda, the quartet is hastily rounded off with an exulting, splendid close fuming with intensity.

**A Sound but Half Its Own:
Conversations in Romantic
Imagination (panel)**

Katie Bergren '04, English, Giffen Maupin '04, English and Latin, and Andi Pinto '04, English
ADVISOR: *Alison Hickey, English*

The Romantic poets (and company) share a preoccupation with the conflation of subject and object, the mutual influence of "eye" and "I," mimesis and translation, power and agency, the interplay between the living and the dead, and the intersection of time and eternity in the sublime moment. Flowing through all is a current of skepticism regarding dualistic formulations. (1) Wordsworth draws a distinction between "imagination," which transforms its object to create existence anew, and "fancy," a weaker, flightier power. The two categories exist in a dynamic relationship that casts doubt on the autonomy of the poet's "I." (2) P.B. Shelley and Jorie Graham each expand metaphors from the Orpheus and Eurydice myth, adapting the myth's conflicts of love and voice to comment on their own struggles as poet-translators. (3) In "Ode to the West Wind," Shelley pairs his own version of the sonnet form with the *terza rima* of Dante's *Commedia*. Appropriating Dantesque images, the poem delineates a theory of "power" with an idea of autumn as canvas. How does Shelley's poem correspond, in form and force, with Keats's ode "To Autumn"?

Multicultural Research

**Contemporary Religious Issues
(paper session)****Serving God, Country, and the Poor: The
Religious Community's Debate over the
Faith-Based Initiatives**

Keigh Hammond '04, Religion and Russian Language and Literature
ADVISOR: *Stephen Marini, Religion*

Politicians on both sides of the aisle have shown a renewed interest in the potential of faith-based organizations to address the social concerns in their neighborhoods. The Welfare Reform Act of 1996 permitted faith-based organizations to retain their religious character and still compete for federal funding. In his first month in the White House, President George W. Bush established the Office of Faith-Based and Community Initiatives in order "to enlist, equip, enable, empower, and expand the work of faith-based and other community organizations." In the faith community, these government-initiated efforts to strengthen the partnership between religious organizations and the state have found both unlikely support and unlikely opposition as the issue shifts the traditional social-policy positions of American's liberal and conservative denominations. I will examine this unique debate and interpret the faith communities' reactions in light of their evolving social theology.

**The Unlikely Coalition: Muslim and
Secular Women Reinterpret Islamic
Law on the Front Pages of the Women's
Press in Iran**

Narges Bajoghli '04, International Relations
ADVISOR: *Katharine Moon, Political Science*

This presentation looks at the role of the women's press in post-Revolutionary Iran and the manner in which this press is a bridge for the unlikely cooperation between Muslim and secular women. Since the 1979 Revolution, there has been a drastic and complex change in women's



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positions in Iran. Through the establishment of the Islamic Republic immediately after the Revolution, many rights were taken away from women and laws were enforced so as to actively discourage women from taking part in the public sphere. Yet, within the same context, women were given a prominent position in the constitution, which defines them as mothers and citizens. It becomes obvious to the observer of Iranian society that despite the image of the *chador*-clad woman in post-Revolutionary Iran, the issue of gender and gender relations is situated at the center of the Islamic Republic. It is within this complicated, and at times schizophrenic framework of the Islamic Republic that I look at the struggle for women's rights that takes place on the pages of Iran's thriving press. (Research supported by a Schiff Fellowship.)

Talking about God: A Feminist Study in Metaphorical Theology

Elissa Johnk '04, Religion and Political Science
ADVISOR: Sharon Elkins, Religion

My aim is to provide a feminist theology that understands equality as its central tenet in order to provide a theoretical basis for overcoming unjust distinctions that persist within U. S. society. Religion plays a fundamental part in the shaping of our socio-political mores, and as such, it is a source that feminists can use to affect political change. Yet, in the past thirty years, the mainstream feminist movement has taken the stance that traditional Christianity is not appropriate for the feminist and feminism is not acceptable for the traditional Christian. Metaphorical theology, with its focus on language, provides a helpful way to include a wide range of Christians in the feminist dialogue. Using the metaphor of Jesus as rabbi, I explore how the tenets of feminism and the seeds of interreligious dialogue are already present within the core concepts of Christianity.

Science and Technology

Science by Computer (paper session)

Monte Carlo Simulations on One Electron per Site, Two-Dimensional Square Lattices

XinXin Du '06, Physics and Math
ADVISOR: Courtney Lannert, Physics

I looked at the behavior of insulating magnets by considering their electron to electron interactions. I modeled the magnets as two-dimensional square lattices with an electron at each lattice point. Any system of electrons has a wave function associated with it. But since the wave functions of multielectron systems are very difficult to solve analytically, I used a method of numerical simulation called Monte Carlo to study the behavior of these many electron systems. Monte Carlo methods involve biased random walks through some particular "space" of a system. I looked at models of ferromagnets, anti-ferromagnets, anti-ferromagnets with electron vacancies, and a fully quantum mechanical state. Using Monte Carlo and imposing certain probability distributions over the random walks, I was able to look at the thermodynamic properties and metastable states of these systems. (Research supported by the Howard Hughes Medical Institute.)

Predicting sRNA and mRNA Interactions

Kristen Kai '04, Biological Sciences and Carly Satsuma '04, Biological Sciences
ADVISOR: Brian Tjaden, Computer Science

Little is known about the specific functions of small noncoding RNA genes (sRNAs) in the cell. These genes may play a role in translation regulation by binding directly either to mRNAs, or to the proteins that make up the RNA polymerase translation complex. However, further work is necessary to better characterize these interactions and to increase our understanding of how sRNAs function. sRNA and mRNA interactions can be characterized by certain traits, such as the binding of sRNAs upstream of the

mRNA's translation start site, AT rich regions around the binding site, and binding initiation in a loop region of the sRNA secondary structure. We are currently using these traits to design a Python computer program which identifies the location and identities of potential sRNA and mRNA interactions.

The Efficient Generation of Random Programs and Their Applications

Jue Wang '04, Computer Science and Math
ADVISOR: Franklyn A. Turbak, Computer Science

For my senior honors thesis, I am investigating the efficient generation of random programs and their applications. Even though a computer program is typically viewed as a specific set of instructions written to perform a certain task, it is more fundamentally just a tree-shaped datum and, as such, can be analyzed and created by other programs. For example, compilers, type checkers, and parser generators are programs that either take other programs as inputs or yield programs as results. There are two main applications of random programs. First, being able to generate programs randomly allows us to study interesting properties of programs. Second, random programs also allow us to perform average case analysis of algorithms such as type inference that require programs as inputs. I will present an algorithm that generates a random lambda calculus program and discuss some of the results gathered from experimenting with this algorithm.

Making Sense of the Senses (paper session)

Preschoolers' Social Awareness: Recognizing Peers' Relationships

Jennifer M. Weaver '04, Psychology and Mathematics
ADVISOR: Tracy R. Gleason, Psychology

Social awareness is the extent to which one is able to recognize peers' relationships and distinguish between the nature of said relationships—are they reciprocal

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friendships, unilateral friendships, or acquaintance relationships? This research examines whether preschool children are aware of their peers' relationships and if so, how that awareness is influenced by a number of variables. Do preschoolers who express greater awareness of the differences between their own relationships display higher levels of social awareness? Is there a positive correlation between popularity and social awareness? Four-year-olds are expected to be more socially aware than three-year-olds, but how does gender relate to social awareness—are girls more socially aware than boys? How do birth order and number of siblings factor into the equation? While this ability seems innate to the adult versed in the nuances of friendship, little empirical attention has addressed the development of this complex process in early childhood.

The Vocal Repertoire of Marineland Killer Whales: I Know What the Caged Whale Sings

Andrea Hodgins-Davis '04, Biological Sciences

ADVISOR: *Emily Buchholtz, Biological Sciences*

Killer whales (*Orcinus orca*) share complex, group-specific acoustic repertoires. The necessary first step in studying communication is the description of a group's repertoire. In this project, I analyze the repertoire of a group of captive killer whales housed at the Marineland facility in Antibes, France.

The analysis involves selecting individual vocalizations from a body of recordings spanning nine months, creating a classification system for separating vocalizations into categories by ear, and collecting acoustic parameters that describe overall vocalization structure. I look at timing and rate of call production in relation to season and daily schedule and test whether certain types of calls are more commonly associated. Finally, I use the acoustic parameters logged to quantitatively describe each vocalization type and to test whether my subjective categories

are statistically significant descriptions of discrete groups. I will present these methods, a summary of my results, and the further implications of this data. (Research supported by a Schiff Fellowship.)

It Pays to Pay Attention: Multitasking and Memory

Nicole Van Buren '06, Neuroscience and Philosophy

ADVISOR: *Margaret M. Keane, Psychology*

Has it ever been apparent to you that you are better able to learn things when you are focused solely on them? And doesn't your ability to learn something in the first place affect your retention of that knowledge? For instance, when studying for a test, it wouldn't seem wise to be simultaneously watching television and then expect to do very well on that test. In this case and many others, it would seem that the ability to retrieve information relies at least partly on the level of attention paid during initial exposure to that new material. We explored this relationship by conducting a laboratory experiment that tested how the level of distraction when studying new information affects later memory for that information. We will discuss the implications of our findings regarding study attention level and memory test performance.

Sometimes Remembering Means Forgetting

Lindsay Lewis '04, Cognitive and Linguistic Sciences and Studio Art

ADVISOR: *Margaret M. Keane, Psychology*

Have you ever noticed how sometimes it can be helpful to forget one thing in order to remember another? For example, it is more useful to remember where you parked your car today than yesterday. In order to remember where you parked today it is helpful to forget where you parked yesterday, right? In this case it is easier to remember one thing if you forget something else. Memories are often strengthened through rehearsal and practice of the information to be remembered. We conducted a laboratory experi-

ment to examine "retrieval-induced forgetting," the phenomenon that strengthening memory for some items through rehearsal can cause other unrehearsed items to be suppressed. This presentation will address the findings and implications of our study regarding the role of retrieval-induced forgetting in remembering.

When Nature Signals (paper session)

Serotonin and Neurogenesis in the Lobster Brain

Sarah Rogan '04, Neuroscience

ADVISOR: *Barbara S. Beltz, Biological Sciences*

While researchers have documented continuous neurogenesis in both vertebrate and invertebrate brains, the factors that control that process are not understood. Serotonin is one factor known to influence the rate of neurogenesis. In lobsters, down-regulation of neurogenesis occurs when serotonin is pharmacologically depleted and is not available in the brain at normal levels. In addition, when isolated, dissected brains (the *in vitro* condition) are incubated with serotonin, the levels of neurogenesis increase. On the other hand, contrary to the expected result, in live animals (the *in vivo* condition), incubation in serotonin down-regulates neurogenesis. One possible cause of the disparity between the *in vitro* and *in vivo* conditions is the presence in the latter case only of hormones from the lobster's sinus gland which could affect the rate of neurogenesis. My presentation investigates the disparity between the *in vitro* and *in vivo* conditions, looking specifically at the effect upon neurogenesis of sinus gland hormones. (Research supported by the Howard Hughes Foundation and NSF IBN 0091092.)

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Who Turned Out the Lights? Exploring the Effects of Photoperiod on Neurogenesis in the American Lobster, *Homarus americanus*

Ashley M. Palmer '04, Biological Sciences
ADVISOR: Barbara S. Beltz, Biological Sciences

Neurogenesis has been discovered in the central nervous system (CNS) in a variety of animals including meadow voles, canaries, rats, and humans, as well as the olfactory pathway in the American lobster, *Homarus americanus*. Environmental factors such as living conditions, social interaction, and photoperiod have been shown to affect the numbers of newly born cells in cluster 10 of the lobster deutocerebrum. Previous work demonstrating the effects of photoperiod on neurogenesis revealed that animals exposed to a 12:12 light:dark cycle showed a peak rate of neurogenesis occurring at dusk and a trough at dawn. Neurogenesis was measured using bromodeoxyuridine, a thymidine analog, which incorporates into the DNA in newly dividing cells. In my experiments, a 16:8 light:dark cycle was used to explore the effects of long-day photoperiod on neurogenesis. Experiments were also employed to determine whether neurogenesis rates increase before or after the light changes associated with dawn and dusk. (Supported by the Howard Hughes Foundation and NSF IBN 009192.)

The Effects of Light Intensity on GFP-Labeled Mitochondria in *Arabidopsis Thaliana*

Brita Jessen '04, Biological Sciences
ADVISOR: Martina Königer, Biological Sciences

Mitochondria were thought to be organelles that exhibit only football-like shapes. However, with the use of advanced microscopy, we learned that mitochondria exist in a variety of sizes (0.2 μm - 12 μm), with some being small and spherical while others are long and branched. The mitochondria can also be stationary or highly mobile. Even within a

single cell, mitochondria exhibit a range of shapes, sizes, and behavior. This study seeks to characterize the differences of mitochondria morphometry and mobility in the epidermal layer of *Arabidopsis thaliana* leaves in response to light. We examined GFP-labeled mitochondria using laser scanning confocal microscopy in fixed and live tissue after exposure to high light or low light as a way to determine the influence of light on plant mitochondrial behavior. Preliminary results indicate that mitochondrial shape is influenced by factors such as cell type, leaf side (upper versus lower), and light intensity.

The Orchestration of Cell Cycle Control in Yeast

Kieran Pechter '04, Biological Sciences
ADVISOR: Jennifer Hood-DeGrenier, Biological Sciences

The eukaryotic cell cycle oversees the growth and division of cells through protein-protein interactions. Specifically, the interactions between cyclins and cyclin-dependant kinases (Cdks) serve to localize an active kinase to substrates in different regions of the cell. An example of this differential localization is being explored in the budding yeast *Saccharomyces cerevisiae*. Dividing yeast possess a unique structure at the mother-bud neck: a septin ring. This ring forms an hour glass shape just beneath the cytoplasm, and serves as a scaffold for proteins important for bud morphogenesis and cytokinesis. One protein known to localize to the septin ring is Clb2, the primary mitotic cyclin. Clb2 is recruited to the bud neck by the Bud3 protein. During G₂ and M phase of the cell cycle, Clb2 binds to and activates the yeast Cdk, Cdc28. The existence of direct biochemical interactions between Bud3-Cdc28 or Clb2-Cdc28-Bud3 are currently being explored.

Relaxing, Shifting, and Folding: Senior Research in the Chemistry Department (panel)

Conformational Effects of Strengthened Hydrogen Bonding in a Thioxo Beta-Hairpin

Erzsi M. Szilagyi '04, Chemistry
ADVISOR: Julia H. Miwa, Chemistry

Protein misfolding has been recognized as a source of diseases such as Alzheimer's. In order to develop potential therapeutics, it is necessary to understand the source of protein misfolding. The approach utilized here is to strengthen the backbone hydrogen bonding of a 12-residue peptide known to assume a β -hairpin structure by replacing one of the amide bonds with a thioamide bond. The amino acids in the β -hairpin sequence H2N-Arg-Tyr-Val-Glu-Val-dPro-Gly-Orn-Lys-Ile-Leu- ψ [CS-NH]Gln-NH₂ were coupled using standard solid phase peptide synthesis. The thioamide bond was incorporated into the sequence by replacing the amide oxygen in Fmoc-Leu with a sulfur and forming a nitrobenzotriazole leaving group on the C-terminus. Mass spectrometry has confirmed the successful synthesis of the thiopeptide, and nuclear magnetic resonance (NMR) and circular dichroism (CD) spectroscopies will be used to investigate the conformational effects of strengthened hydrogen bonding on the β -hairpin. (Research supported by the ACS Petroleum Research Fund and the Howard Hughes Medical Institute.)

Synthesis of a Cyclic Peptide: Analog of a 12-Residue Beta-Hairpin

Laure-Anne M. Ventouras '05, Biological Chemistry
ADVISOR: Julia H. Miwa, Chemistry

The study of the secondary structure of 12-residue peptides that adopt a β -hairpin conformation has shown that the thioacylation of an amino acid increases the strength of hydrogen bonds between the two strands of the hairpin. 2D-NMR and CD spectra of the hairpin peptide can provide a quantitative measure of the

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percentage of hairpin conformation if data is available for the two extremes: 100% hairpin and 0% hairpin.

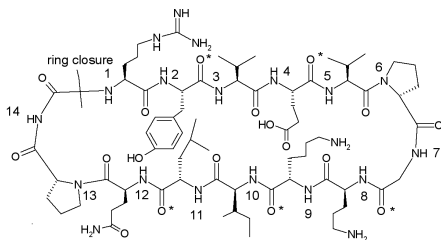


Figure (1): cyclic 14-residue peptide

The present research focuses on the synthesis of a 14-residue cyclic peptide (Fig. 1) that will be used to provide data for the 100% hairpin case. The amino acid sequence of the cyclic peptide was synthesized using solid phase peptide synthesis. The cyclization step is a synthetic challenge that was approached using two different methods: “on-resin” and “off-resin” cyclization. Once this challenge is overcome, the data obtained by different spectroscopic methods will be used as reference for the determination of hairpin percentage for the 12-residue thioxopeptides. (Research supported by the Jerome A. Schiff Fellowship and the ACS Petroleum Research Fund)

Synthesis of Potential Anticancer Drugs

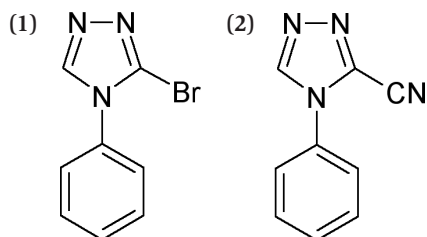
Sarah Poe '04, Chemistry

ADVISOR: David R. Haines, Chemistry

The nucleoside adenosine is involved in a range of biological functions, from nucleoside biosynthesis to viral mRNA-capping. By creating an analogue of adenosine, the enzymes involved in these functions can be inhibited, resulting in antiviral and anticancer activity. In order to create desired adenosine analogues, nucleophilic addition of either a nitrogen or a cyano group onto C-3 of 3-bromo-4-substituted-1,2,4-triazole (1) was necessary.

Generation of a triazolium intermediate (via oxidation or alkylation of a nitrogen adjacent to the halide) gives easy displacement of the halide, but difficult conversion to the desired products. Direct nucleophilic aromatic substitution onto the

triazole using KCN in DMF, gives 3-cyano-4-phenyl-1,2,4-triazole (2), but in very low yield. Use of CuCN, on the other hand, gives a much more efficient displacement, most likely due to complexation of the copper to the adjacent nitrogen. Reduction can then be performed by catalytic hydrogenation. The synthesis of 2 as well as further reactions of this compound will be discussed. (Research supported by the Howard Hughes Medical Institute.)



Factors Affecting Active Site Flexibility

Ana Tablante '04, Biological Chemistry

ADVISOR: Adele J. Wolfson, Chemistry

Thimet Oligopeptidase, EC 3.4.24.15 (TOP) is a zinc metalloendopeptidase that is distributed throughout the body. This enzyme has a variety of substrates including the blood pressure regulator, bradykinin. Since it is able to accommodate a large number of substrates, TOP is thought to have a flexible active site. We have used the denaturant, urea, to study the flexibility of the active site in binding different substrates. The activity and stability of TOP monomers, dimers, and multimers were examined. The substrates used were a fluorogenic version of bradykinin and a smaller fluorogenic substrate. It was shown in these studies that the enzyme in dimeric and multimeric conformation denatures with increasing urea concentrations but loses activity at different rates for the different substrates. By comparing the activity of the enzyme forms using both substrates, we were able to conclude that TOP flexibility, as modeled by unfolding in urea, allows binding of a variety of substrates. (Research supported by the Howard Hughes Medical Institute.)

Watching Mice Think: Investigating Functional MRI in Mice

Ellie Graham '04, Physics

ADVISOR: Nancy H. Kolodny, Chemistry and Ted Ducas, Physics

Functional Magnetic Resonance Imaging (fMRI) is currently the technique of choice for mapping brain activity in humans and animals. fMRI can be used to generate images of the brain that show which areas are active during a particular motion or thought process of the subject, or in response to a stimulus. The goal of this work has been to implement BOLD (Blood Oxygenation Level Dependent) fMRI for mice on the MRI system in the Science Center. Experiments include one in which mice breathe a higher-than-normal level of CO₂, which mimics the BOLD effect, and electrical paw stimulation. Structural and functional images of the brain can be superimposed in order to generate a picture in which areas of the brain are both clearly visible and color-coded for activity level. (Supported by the Howard Hughes Medical Institute and the National Science Foundation.)

Brain Structural Development in Rett Mice: Volumetric Analyses of MRI Images

Li Ma '04, Chemistry

ADVISOR: Nancy H. Kolodny, Chemistry and Joanne Berger-Sweeney, Biological Sciences

Rett syndrome is a devastating neurodevelopmental disorder that strikes infants. Molecular etiology of this syndrome is unknown, but mutations of the MeCP2 gene are associated with 50% of familial cases and 80% of sporadic cases. Since symptoms do not surface until patients are 6-18 months old, several murine models, including *Mecp2*^{11ox}, have been developed to allow researchers to study the initial asymptomatic stages. A protocol has been developed, using the micro-MRI system at Wellesley College, to follow the structural development of the *Mecp2*^{11ox} mouse brain. Beginning the seventh day after birth, mice are imaged weekly until

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they are sacrificed after the fourth imaging session. The brains are perfused and the histological data provide a reference for navigating MR images. Several pulse sequences (MSME, RARE, and DTI) are utilized to obtain optimal contrast and image quality. The volume measurements of the MR images are made using AMIRA software. (Research supported by the Howard Hughes Medical Institute.)

Activity-Dependent Mapping in Crayfish Using Manganese-Enhanced Magnetic Resonance Imaging

Catherine K. Brinkley '04, *Biological Sciences and Russian*

ADVISOR: Barbara Beltz, *Biological Sciences and Nancy H. Kolodny, Chemistry*

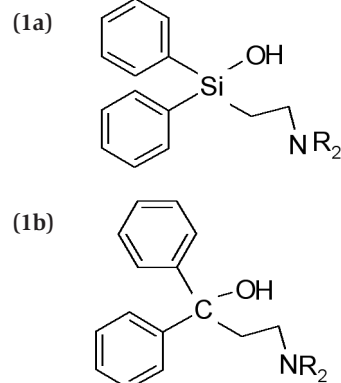
Previous MRI studies have made activity-dependent maps of the brain by capitalizing on the paramagnetism of blood hemoglobin. Such techniques are not available in invertebrates which have hemolymph rather than blood. Neural activity can, however, be mapped in the crayfish animal model using T_1 weighted manganese (Mn^{2+}) enhanced MRI (MEMRI). By imaging an invertebrate with MEMRI, we can visualize active regions of the brain without the activity-interference procedures required for mammals such as breaking the blood brain barrier or anesthesia. In addition, animals can be imaged for a longer duration, providing higher resolution MR images. In MEMRI, Mn^{2+} replaces Ca^{2+} and preferentially accumulates in regions of increased neural activity. Antennular tract-tracing and antennular ablation showed Mn^{2+} accumulation ipsilaterally in the olfactory lobe (OL). This result supports previous studies and provides a template for future studies of the complex pathways of odor-induced behavior. (Supported by a Schiff Fellowship and the Howard Hughes Medical Institute.)

Explorations of Science and Technology (poster session)

A Computational Chemistry Investigation: Dimethyl and Diphenyl Organosilanes and Their Carbon Counterparts.

Natasha Soodoo '06, *Biological Sciences*
ADVISOR: Jean Fuller-Stanley, *Chemistry*

Silicon comprises 28% of the earth's crust and is found in nearly every living organism and aspect of nature. Organosilicon substances have found increasing use in the field of medicine as sila-drugs. For example, the antimuscarinic agent sila-difenidol (**1a**) was found to be ten times more potent than the carbon counterpart difenidol (**1b**).



Calculations, using PC SpartanPro, will be used to study R2MHX type compounds (R = Ph, Me; M = Si, C; X = Cl, OCH₃, OCOCF₃, OSO₂CF₃). Theoretical properties, such as bond lengths, atomic charges, and IR spectra, will be determined. The IR vibrations of the M-H bonds will be used as a major indicator of stereo-electronic changes. These data will allow us to compare the effects of the size and electronegativity of different groups on carbon versus silicon and provide some understanding of the mechanism for sila-drugs and their carbon analogues. (Research supported by Howard Hughes Medical Institute.)

Substrate Showdown: The Activity of Monomeric vs. Dimeric Enzyme on Two Different Substrates

Johane Alexis '06

ADVISOR: Adele J. Wolfson, *Chemistry*

The enzyme Thimet oligopeptidase (TOP) breaks down peptides that act as biological signals. Our laboratory uses two quenched fluorescent TOP substrates: a short (5-residue) peptide and a longer peptide (9-residues) derived from bradykinin (Bk). In order to evaluate the difference in activity for monomers and dimers, several activity assays were conducted. The results so far have shown that the activities towards both the small and larger substrates are higher when the enzyme is a monomer. In addition, the activity towards Bk for both monomers and dimers is greater than the activity towards the small substrate. It is likely that TOP is a monomer under physiological conditions. (Supported by the Howard Hughes Medical Institute.)

Photon Phrenzy

Elizabeth Lundin '06

ADVISOR: Wendy Bauer, *Astronomy*

Symbiotic star systems consist of a pair of stars that orbit each other around a common center of mass. Such systems are quite common throughout the galaxy and can offer clues into the nature of the universe. By studying these systems, valuable information about the mass and other characteristics of these stars can be determined. Using Wellesley's 24-inch telescope and astronomical software, I was able to gather data on these star systems and generate a series of light curve charts that can be analyzed to reveal the characteristics of these systems.

Chloroplasts: Solving a Moving Puzzle

Brit-Maren Schjeide '06, *Neuroscience*

ADVISOR: Martina Königer, *Biological Sciences and Robbie Berg, Physics*

In order to understand factors influencing chloroplast movement in *Arabidopsis thaliana*, we developed a piece of equipment which enables us to track the movement of chloroplasts in response to

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blue light. The system involves a blue light source, a red measuring light, and a red light detector. The resulting data are used to calculate the percent of light transmitted through the leaf, which indirectly measures chloroplast positioning. The results show that dark-adapted leaves respond to intensities below $5 \mu\text{mol photons m}^{-2} \text{ s}^{-1}$ by moving their chloroplasts toward the center of the cell and, transmission decreases. At higher light intensity, chloroplasts move towards the sides of cells, and transmission increases. The chloroplasts respond to changes in intensity as small as $0.1 \mu\text{mol photons m}^{-2} \text{ s}^{-1}$. We are comparing the behavior of wild-type plants to mutants in hopes of identifying specific factors and components responsible for chloroplast movement.

The Long and the Short of It: Convergence and Innovation in Evolution

Claire Schlemme '06

ADVISOR: *Emily Buchholtz, Biological Sciences*

Body elongation has occurred repeatedly, but apparently by a variety of different processes in vertebrate evolution. Developmental theory suggests that genetic control of the vertebral column is modular instead of particulate. In this project, I document the shape and count of vertebrae in column modules of both mammalian (Carnivora) and reptilian (Squamata) test groups in an attempt to identify the historical changes in developmental processes that led to observed vertebral patterns. Possible causes include changes in somite count (a module adds or loses vertebrae independent of other modules), homeotic shifts (the boundaries between modules change, but the overall count remains the same), allometry (individual vertebrae change length in a module of fixed count), or some combination of the three. I use observed changes to formulate a hypothesis for the radically different evolutionary responses to similar selective pressures for body elongation in the histories of whales and ichthyosaurs.

Effects of Beta-Agonists on Rat Cardiomyocytes Studied *In Vivo*

Magda Stumpfova '05, Biological Chemistry

ADVISOR: *Dennis M. Smith, Biological Sciences*

Clinical studies have suggested a correlation between long-term medical use of adrenergic beta-agonists and heart failure. Isoproterenol, an adrenergic beta-agonist, has been shown to induce apoptosis in rat cardiomyocytes after 24- and 48-hour continuous treatment. A similar experiment was conducted to examine the effects of Isoproterenol after four- and eight-hour treatment using electron and light microscopy. Experimental white male rats were implanted with a subcutaneous osmotic pump delivering three mg. Isoproterenol/kg/day. Control animals received saline vehicle alone. After four or eight hours, cardiac tissue was fixed and processed by standard methods and viewed by light and electron microscopy. Electron microscopy revealed subtle changes in cardiomyocytes after the four-hour treatment. Apoptosis became much more pronounced in the animals treated for eight hours, including large intercellular spaces, cell surface blebbing and mitochondrial condensation. Depletion of glycogen was apparent in both experimental groups. Additionally, the most pronounced signs of apoptosis were observed close to blood vessels, possibly indicating concentration gradient effects. In conclusion, there is a suggestion that beta-agonists can induce apoptosis in cardiomyocytes after as little as four hours of treatment. (Supported by the Goergeanne Miller Mulhern Fund.)

Cardioprotective Mechanism for K_{ATP} Activation during Hypoxia in Goldfish

Julia Zhu '04, Neuroscience

ADVISOR: *John S. Cameron, Biological Sciences*

The activation of potassium ion channels in the heart may protect the tissue under low oxygen conditions, thereby enhancing tolerance of hypoxia in aquatic verte-

brates. The purpose of this study was to determine whether nitric oxide (NO) plays a cardioprotective role in the activation of ATP-sensitive potassium (K_{ATP}) channels in a species highly tolerant of low oxygen environments, the goldfish (*Carassius auratus*). During moderate hypoxia, cardiac K_{ATP} channels were activated; this response was mimicked by the NO-donor SNAP but abolished by an inhibitor of NO synthesis (L-NAME). Isolated ventricular muscle cells were then incubated under normoxic and hypoxic conditions; cell viability was decreased in hypoxia—an effect that was eliminated during exposure to SNAP or a specific activator of K_{ATP} channels. These protective effects were abolished by L-NAME. My data support a role for an NO-dependent activation of K_{ATP} channels in goldfish heart, potentially enhancing the tolerance of this species to hypoxia. (Supported by NSF grant DBI-0097499.)

The New Economics of the Film Industry: Reeling in Digital Technology to Cast a Better Business Model

Amanda G. Dupuy '04, Economics and Psychology, Vivian A. Kao '04, Economics and Chinese Studies, and Jessica M. Lee '04, Economics

ADVISOR: *Ann D. Witte, Economics*

The development of sophisticated digital-copying technology has revolutionized consumer use of copyrighted media. With the click of a mouse, consumers can transfer bootleg versions of the latest blockbuster movies via high-speed Internet connections to their home computers. DVD technology has reduced the cost and ease of film reproduction, causing the illicit distribution of movies to soar. As the film industry experiences the impact of technological change, it can no longer rely on the traditional business model in making distributional and marketing decisions. In our study, we answer the following questions: How has this business model changed? What would an alternative model that incorporates technological advancements look like? We also examine the economics of copyright

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law and the development of copyright legislation as it relates to the film industry.

Social Analysis

International Political Issues (paper session)

Socioeconomic Conditions in Gaza and the Activities of Hamas in the Region

Jennifer Thea Gordon '04, Middle Eastern Studies

ADVISOR: *Barbara Geller, Religion*

My Ruhlman presentation examines the socioeconomic conditions in Gaza and Hamas's role in providing social services. I begin by discussing conditions in Gaza from 1948 through 1987, the date of the first Intifada, and follow with a more detailed description of the situation in Gaza from 1987 through the present. In the second part of my presentation, I give an overview of Hamas's history and ideological framework. I explain the ways in which Hamas has endeavored to address socioeconomic conditions in Gaza, and how it has gained a grassroots constituency, in part, through these efforts. I explore Hamas's activities, including both its role as a provider of social services in Gaza, and its activities of violence. Finally, I examine roles played by the Palestinian Authority, NGOs, and international aid in addressing the needs of the people of Gaza.

Globalization and International Shipping: How Do States Respond?

Jessica Bernfeld '04, Political Science

ADVISOR: *Elizabeth R. DeSombre, Political Science*

The international system has changed rapidly over the past century. Because of an increase in transnational corporations and international organizations, globalization has facilitated new levels of interaction across state borders, affecting both states' international and domestic policies. As companies in this new international economy compete, they are drawn to places where the cost of development is

less and environmental and labor standards are lower. States, therefore, must also compete to maintain their industries and economic wealth, a phenomenon visible in the international shipping industry. Due to economic competition, the tonnage of ships registered in traditional maritime states has decreased while the tonnage in open (and less heavily regulated) registers has increased dramatically. There is significant variation in how different states respond domestically to these open registers. This project is an examination of the factors that could potentially affect national shipping policies, and will add to the continuing discussion on how states contend with international economic competition.

The Cloak-and-Dagger Diplomat: Robert Murphy in French North Africa, 1940-1943

Louisa T. Olds '04, History

ADVISOR: *Wilfrid J. Rollman, History*

"Troubleshooter," "Warmonger Murphy," "Breezy Bob," "Five-Star Ambassador". It is hard to believe that history has overlooked a man with such credentials. Diplomat Robert Murphy played an important role in the formation of American foreign policy in French North Africa during World War II; however, the man who made the American invasion of North Africa politically and militarily successful has received little attention. The charismatic and astute Murphy emerged from obscure beginnings in the Foreign Service, becoming President Roosevelt's personal representative to North Africa in 1940 where he was in charge of American political operations. Via secret encounters and private meetings, Murphy became intimately acquainted with prominent French officials, French civilians and North African organizations. Murphy orchestrated Franco-American agreement on the Allied invasion and occupation of French colonies. This presentation will focus on Murphy's clandestine diplomatic work and its effect on American policy toward North Africa and France.

Emerging Infectious Diseases and Globalization: Effectiveness of the Revised International Health Regulations

Theresa Sommers '04, International Relations

ADVISOR: *Craig N. Murphy, Political Science*

In March 2003, the world learned of an unknown and potentially dangerous infectious illness that emerged from the Guangdong province of China and rapidly spread worldwide. This highly contagious illness, called Severe Acute Respiratory Syndrome (SARS), illustrates the potential danger of new and reemerging infectious diseases within an integrated global community. How exactly is the emergence, spread, and control of infectious diseases related to globalization? What are the international-level efforts that address this issue? My thesis examines globalization and epidemiology separately in order to identify and evaluate their common characteristics. Using this analysis, I then consider how these shared attributes affect global interventions for infectious diseases and other public health emergencies. Specifically, I look into the effectiveness of recent revisions to the International Health Regulations (IHR), put forth by the World Health Organization (WHO).

What is Patriotism? (paper session)

Privacy, Power, and the USA PATRIOT ACT

Rachael Ward '04, Political Science

ADVISOR: *Roxanne Euben, Political Science*

The swift passage of the PATRIOT ACT and the changes it made to surveillance laws have led to a perception on the part of some civil liberties activists that it heralds a new era of widespread threats to "privacy rights" by the government. The Bush Administration and the Justice Department, however, dismiss these concerns. They claim that government monitoring should not be feared because it helps prevent new terrorist attacks from

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occurring. In my senior thesis, I analyze these claims as part of an examination of the influence of technology and the role of government in privacy law relating to surveillance. Utilizing Michel Foucault's theory of disciplinary power, I question the assumptions made by both sides as to the source of the threat. Ultimately, I examine how this perspective illuminates necessary changes that must be made to the legal framework in order to ensure safety and to preserve privacy rights.

Code Red: Is America Fighting a War on Cyberterror?

Tara A. McGovern '04, International Relations

ADVISOR: *Robert Paarlberg, Political Science*

In the wake of the September 11 terrorist attacks, American politics has taken a sharp turn. President Bush pushed through the passage of the USA PATRIOT ACT and created the Department of Homeland Security. Under the auspices of the War on Terror, the government now oversees airport security with the Transportation Security Administration and wants to increase border patrols in the south and boost security in the north. This increase in regulation has been felt in some sectors but not everywhere. Have government and private information technology sectors come under the same increased counter cyberterror regulations as other relevant sectors? Is the fear of an "Electronic Pearl Harbor" justified? After reviewing the history of emergency wartime regulation of industry from the Civil War to the Cold War and analyzing the current actions of the government, I shall determine whether the industry is being subjected to a wartime standard of regulation. If so, are the regulations being imposed with or without compensation? If not, is the explanation industry resistance or something else?

Russian Heroes and Apathetic Americans: Emma Goldman's Anarchist Movement

Maggie O'Grady '04, History

ADVISOR: *Jerold Auerbach, History*

"Not even in the domain of the Tsar is personal liberty outraged to the extent it is in America, the stronghold of the Puritanic eunuchs," wrote the Anarchist Emma Goldman in 1909. Goldman came to the United States from Russia in 1885, when she was 16 years old. By the age of 20, she was living in a New York City commune with would-be assassin Alexander Berkman and lecturing on the overthrow of the government in front of hundreds of people. The Russian influences on Goldman's anarchism, as well as her vision of America as an inherently anarchist nation that had been duped by democracy, influenced her career, from her part in the attempted assassination of Henry Clay Frick and imprisonment for inciting riot, to blindly supporting the Bolsheviks and conspiring against the draft. Goldman's anarchism and propaganda were rooted in Russian revolutionary ideals, and she attempted, usually without success, to use her faith in and love of Russia in spreading anarchy to the "poor, stupid, free American citizen!" until her deportation in 1919. (Research sponsored by the Henry F. Schwarz Fund.)

The Patriotic Self in a Post 9/11 Context (panel)

A Discussion of American Patriotism in the Post 9/11 Context

B. Nadya Jaworsky D3, Sociology and American Studies, Cecilia A. Fong '04,

Peace and Justice Studies, MaryAnn Moran '04, Joanna Rich '04,

American Studies, and Sarah M.

Evenski '04, Psychology

ADVISOR: *Thomas Cushman, Sociology*

Following the events of September 11, 2001, there has been an outpouring of American patriotism. Is this a new form of American patriotism or simply a type of social solidarity reawakened? The answer is far from simple. While patriotism might

seem to be a homogeneous form of cultural expression, it is a much more complex phenomenon than meets the eye. This panel focuses on the sociological complexities of modern American patriotism. The central questions to be explored are: How does being Jewish and American affect one's loyalties or love of nation? Do men and women experience patriotism differently? Is patriotism a masculine form of cultural expression? Is there a difference between civic action and patriotism? These presentations are based on primary research on Americans of all ages, including Wellesley College students, about their expressions of and thoughts about patriotism in the post 9/11 context.

The Impact of Law in the Real World (panel)

Christen M. Arduis '05, Political Science and International Relations, Kimberly

Dello Buono '06, Political Science and Economics, Karlen Powell '06,

Political Science and Spanish, and Jessica Urban '06, Political Science and Spanish

ADVISOR: *Lori A. Johnson, Political Science*

Law and Order. The Practice. Judging Amy. Law and the legal system are significant themes in our cultural mythology. How do real people's experiences with law, litigation, and legal processes compare to the images of law in the media? Considering this question, each participant on this panel conducted in-depth research on an actual legal dispute including interviews of the participants. Presentations will focus on how and why the legal dispute took the course it did, the experience of the people involved in the case, and lessons learned about the character of the American legal system. The specific cases addressed include a criminal charge of child sexual assault asserted by one parent against the other, the successful litigation to obtain the right to marry for gays and lesbians in Massachusetts, and the termination of parental rights and adoption of a child by foster parents.

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Literature and the Arts

Gods, Awful Aunts, and Working Stiffs (performance)

Amber Gray '04, English, Caitlin Graham '05, Cinema and Media Studies and Spanish, Hollee Mangrum-Willis '04, Theatre Studies and Psychology, Alison Buchbinder '05, Theatre Studies and American Studies, Ailin Conant '04, Theatre Studies, Janice Yang '04, Theatre Studies and English, and Emi Kolawole '04, Theatre Studies and International Relations

ADVISOR: *Nora Hussey, Theatre Studies*

In the course of the past year, Wellesley College Theatre and Wellesley Upstage have explored a variety of themes and stories. From the working world of Studs Terkel to the scintillating wit of Oscar Wilde, the theatre at Wellesley has been lively, informed, and challenging. This 70-minute presentation will trace the highlights and the themes explored by students and directors. In song and story, the lives of people from all walks of life are presented. The audience is invited to journey from the factory to the drawing room and meet the many fascinating characters that graced the stages this year. Fast paced and lively, this summation of the theatrical season is a fascinating look at human beings and the complex world they inhabit.

Inspired by the French Flute School (performance)

Victoria Lo '07, Barbara Geoghegan '07, Agnes Hahn '07, Christina Satkowski '07, and Emily Carrigan '06

ADVISOR: *Suzanne Stumpf, Music*

The flute virtuoso and pedagogue, Paul Taffanel, had a strong influence on the development of repertoire for the modern Boehm-system flute after his appointment as Professor at the Paris Conservatory in 1893. He was especially interested in encouraging new compositions by French composers as well as reviving eighteenth-

century French repertoire. During the next fifteen years, Debussy and Ravel began writing for the instrument in their orchestral works in a style that took great advantage of the modern flute's flexibility of tone color. During this time and over the next decades, a fascinating new repertoire of solos and chamber pieces for the instrument was brought forth by numerous French composers. This concert presentation will offer a variety of French flute compositions from that era, including selections by Gabriel Fauré, Claude Debussy, Arthur Honegger, Jacques Ibert, Darius Milhaud, and Taffanel's prize-winning student Philippe Gaubert.

Conceptual Art (interactive teaching presentation)**Painting to Be Constructed in Your Head: Yoko Ono's Instruction Paintings**

Sarah Stone '04, Art History

ADVISOR: *Patricia Berman, Art*

In the 1950s and '60s, Yoko Ono created a series of conceptual art projects consisting of brief, poem-like instructions. Presented in the form of written scores with or without accompanying manipulable objects, these instructions are open-ended and ambiguous in meaning. The *Instruction Paintings* reinterpreted the dynamic, transformative meanings of Marcel Duchamp's readymades, John Cage's experimental scores, and Ono's understandings of Zen Buddhist traditions. The *Instruction Paintings* direct viewers to interact with the world around them in unexpected ways, creating a space for reflection that questions the distinctions among philosophy, art, and life. Despite the simplicity of the instructions, interacting with Ono's work can be a startling and liberating experience. Spectators will be offered the chance to perform some of these works in order to explore their participatory, yet ultimately introspective nature, and to examine Ono's contributions to Conceptual Art. (Research supported by a Schiff Fellowship.)

Studies of the Ancient World (paper session)**De Suo: The Mosaics of the Piazzale delle Corporazioni and Their Social Implications**

Katie Alcauskas '04, Classical Studies and Art History

ADVISOR: *Brendon Reay, Classical Studies and Miranda Marvin, Art*

The Piazzale delle Corporazioni of Ostia was a testament to Rome's wealth and international influence. This portico and the surrounding area were not only a practical space for trade groups and merchants to conduct business, but also a venue for exhibiting their prosperity and pride. The portico was split into small cubicles, in front of which black and white mosaics advertised various commercial ventures in every corner of the Empire. My investigation of the site generally reveals the importance of Ostia as an international commercial gateway for Rome. More specifically, my reading of the mosaics exposes their role in the presentation of "Romanness" for both provincials and for wealthy citizens (often former slaves) who populated this unique town. (Research supported by the Pamela Daniels '59 Fellowship.)

The Thirteenth Book of the Aeneid: A Renaissance Continuation of an Old Favorite

Joanna Theiss '04, Classical Civilization

ADVISOR: *Brendon Reay, Classical Studies*

Since Virgil wrote his famous epic poem the *Aeneid*, readers have been unsatisfied with its conclusion. In 1428, more than a thousand years after the *Aeneid* was written, Maphaeus Vegius composed *A Supplement to the Twelfth Book of the Aeneid*, in order to tie up the "loose ends". Why did Vegius seek to "finish" what could be considered the most famous poem of all time? In my project, I argue that Vegius' *Supplement* seeks to resolve the major conflict of his day, when popes vied for power and councils threatened the preeminence of the papal seat. Like Virgil in Augustan Rome, Vegius

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commented on society through the story of Western civilization's famous hero, Aeneas.

Discovering Ancient Beginnings: Empedocles' Role in Presocratic Philosophy

Baylee Suskin '04, Classical Civilization and English

ADVISOR: *Maud Chaplin, Philosophy*

This talk will explore Empedocles, the ancient Greek philosopher who first divided the material elements into the four familiar parts: earth, air, fire and water. His work entitled *On Nature* addresses and counters the notion that the cosmos is ungenerated, imperishable, immutable, whole, and all-inclusive, which was prominently proposed by Parmenides of Elea. Empedocles' cosmology strives to integrate the two divorced camps of pluralists and monists through a sophisticated relationship between his newly formed elements and the forces of Love and Strife. According to some, Empedocles' second work, called *Purifications*, is in direct conflict with his cosmological views because of its mystical content. The rift between Pythagorean mysticism and the Eleatic tradition in Empedocles' fragments comprises much of the exciting scholarship which surrounds the study of this important and influential philosopher. In my paper, I will offer, as Empedocles once did, a compromise between these transparently conflicting sides of an ancient dichotomy.

Work from the Book Arts Lab (presentation of original work)

Not Your Average Book: A Semester in the Book Arts Lab

Jemma McPherson '06 and Tori Walters '06

ADVISOR: *Ruth Rogers, Art/Library and Katherine McCanless Ruffin, Art/Library*

Littera scripta manet; the written word endures. Clapp Library has books from the beginning of printing, indeed the beginning of writing, which is remarkable considering that the floppy disks we use

now will only last twenty years. In Arts 107 we used the College's Special Collections to learn from the history of books and the Book Arts Lab to create our own. As book artists, we designed and printed broadsides and limited edition books, and our works were added to Clapp Library's Book Arts student archive. Combining the skills of typography and layout with creativity and innovation, we explored the traditional interplay between media and meaning. Join us in the Book Arts Lab to see our work and print your own letterpress keepsake.

Multicultural Research

Judaism: From Past to Present (paper session)

Bargaining with God in the Hebrew Bible

Lael Greenstein '04, Religion and Latin American Studies

ADVISOR: *David A. Bernat, Religion*

Within the Hebrew Bible exist many instances where man bargains with God. My presentation examines the various ways in which major figures negotiate with God in an attempt to change their own fortune or the fate of their larger community. I explore the circumstances that lead to the bargain, the bargain itself, and its relative success. Examples of these bargaining episodes are Abraham's bargain with God for the fate of Sodom and Gomorrah, Moses' bargain with God for the fate of the Israelites, and Job's bargain with God for his own fate. Using these bargains, my study explores various dynamics of the relationship between Man and God in the Hebrew Bible.

Weapons and Tactics in the Dead Sea War Scroll

Barrie Neutze '04, Religion

ADVISOR: *David A. Bernat, Religion*

The War Scroll is one of the Dead Sea Scrolls, written in Hebrew, dated to approximately 200-100 BCE. This scroll deals with an apocalyptic end-of-days

battle between the Sons of Light (Godly Forces of Good) and the Sons of Darkness (Forces of Evil). Among other things, the War Scroll outlines the material and strategy to be employed by the Sons of Light. My paper will be an analysis of the effectiveness of the forces, equipment, and tactics described in the text. I will be comparing the War Scroll to Ancient Greek and Roman martial traditions as well as to the weapons and tactics of the modern day military.

Provincial or Protective? Ethics of Sexual Intimacy and Menstruation in Jewish Law

Jordan Namerow '05, Sociology

ADVISOR: *David A. Bernat, Religion*

The Jewish tradition has historically sanctioned female sexuality and granted the rights of sexual expression to women and men alike. Judaism maintains that the sexual arena of human life is neither intrinsically evil nor intrinsically good. Yet even within the marital framework, the sanctity of sexual relations is largely conditional. The most concrete conditions are dictated by the laws of *Taharat Ha-Mishpachah*, ritual family purity. As Judaism has evolved, these laws have maintained their centrality within traditional Orthodox families, but have been widely criticized or rejected in modern veins of Jewish thought. Do the laws of family purity seek to protect women? Do they elevate the level of sexual sanctity? Are they merely a collection of archaic restrictions? Do they sustain an out-dated taboo? This presentation will provide an overview of *Taharat Ha-Mishpachah* and explore both traditional and contemporary notions of sexual expression and menstruation within Jewish marital lifestyles.

Women's Search for Support, Voice, and Justice (paper session)

Access of Minority and Lower Income Women to HIV/AIDS Care

Tina Wang '04, Sociology

ADVISOR: *Karen McCormack, Sociology and Jonathan Imber, Sociology*

1:30 – 2:40

Access and support remain crucial issues in HIV treatment. Statistics are insufficient to fully analyze the plight that women face when they are infected with HIV. Qualitative analysis of HIV/AIDS infection and treatment is necessary to observe the multiple influences socioeconomics has on HIV/AIDS treatment and treatment accessibility. Intensive interviews were conducted on fifteen women living with HIV/AIDS in the greater Boston area from October 2003 to December 2003. The study found that despite the difficulties of contracting and living with HIV, the diagnosis may also open up avenues of support for women enabling them to make positive changes in their lives. The social support they gained through support groups and medical care mitigated the isolation they felt prior to the access. However, the study also found that the available women-specific support networks were inadequate.

The Maquiladora Murders

Jessica M. Goldman '06

ADVISOR: *Joe Swingle, Sociology and Joy Renjilian-Burgy, Spanish*

Ciudad Juarez, Mexico, is a city where women have been abducted in broad daylight, then raped, murdered, and dumped in the desert. This has been happening to approximately 300-2000 women for over ten years, and little has been done to stop it. The case is neglected by practically everyone, from international human rights organizations, to the police, the media, and the majority of people living in this border city. My independent study Spanish 250 pieces together the known evidence and theories about who is responsible for killing these women and why they are getting away with it today. I will discuss the economic, social, and political contexts of these crimes as well as the impact of gender ideology and globalization in this northern Mexico border town.

Women, War, and Memory in Okinawa: The Literature of Medoruma Shun

Aimee Mizuno '04, Japanese Studies

ADVISOR: *Carolyn Morley, Japanese*

How does a society remember war? What stories are remembered and what stories are silenced in the process of collective remembering? This thesis project explores the relationship of memory, silence, and war in the work of Medoruma Shun, a contemporary Okinawan writer. Born a generation after the Battle of Okinawa, one of the bloodiest battles of World War II, Medoruma uses fiction not only to remember, but to examine the trauma of war and its aftermath. I have focused on his short story, *The Butterfly Tree*, about a young man who uncovers the story of a former “comfort woman” living on the edge of his village. By centering this war story on a woman who had been ostracized from the community both during and after the war, Medoruma demands that collective memory necessarily include those voices from the very edge of the margins. (Research supported by a Schiff Fellowship.)

Silences in Global Labor Governance in the Case of the Sex Worker

Liz Mandeville '04, International Relations

ADVISOR: *Rorden Wilkinson, Political Science*

Sex work has historically been referred to as the “oldest profession”, and yet has never been recognized as “work” in international labor law. The result of this exclusion is the inability of sex workers to access basic labor protections that would significantly reduce their exploitation in what is now a largely dangerous and unregulated industry. This presentation will consider the reasons for this group’s omission from the legal conception of “worker”, including an analysis of the arenas in which sex workers do receive attention in international law, a consideration of the possible economic motivations that cause their exclusion from the category of “worker”, and a focus on the realistic conditions under which sex

workers currently work. Using these considerations (the final piece in particular), I will discuss the importance of recognizing sex workers as workers in an international legal arena, such as the International Labor Organization (ILO), in order to grant sex workers the basic labor protections that they need to ensure their own survival and basic human rights.

Forty Years of African Women’s Presence on the Wellesley Campus (panel)

Chizoba Nnameka '04, Philosophy and Biological Sciences, Marda Hailu '05, Neuroscience, Grace Waruchu Wanjiku '06, Biochemistry, and Maua Herme '06, Biological Sciences
ADVISOR: *Kelly Brown, Director of Harambee House and Ifeanyi Anthony Menkiti, Philosophy*

It has been 40 years since Ghanaian Adwoa Doodoo became the first African graduate of Wellesley College. The panel will discuss the experiences of the students that have followed her. The establishment and activities of two organizations, the former African Awareness Now (AAN) and current Wellesley African Students Association (WASA), will be discussed using the political and economic situations facing the continent as a backdrop. A special one-time commemorative magazine that includes submissions from current African students and from all four decades of alumnae will be distributed. There will be a question and answer session featuring select African Wellesley alumnae.

1:30 – 2:40

Science and Technology

Recognizing Patterns in Randomness (paper session)

Calculating Web Page Trustworthiness by Exploring Communities on the Web

Mirena S. Chausheva '04,
Computer Science

ADVISOR: Panagiotis T. Metaxas,
Computer Science

With the growth of the Internet and the ease with which Web sites can be created, a lot of Web pages of questionable quality have appeared, making it a significant problem to search the Web for trustworthy information. In addition, more and more Internet users rely on and trust information they receive from the Internet. In addition, most people doing a Web search only look at the first page of results returned by the search engine. As a result, for a lot of commercial sites, it is important to appear as one of the first ten search results, and “spam” pages containing advertisement, propaganda material, or “infomercials” try to rank higher. The goal of my research is to implement an algorithm that will be used in a system that will prevent spam pages from qualifying high in the results returned by Web search engines. I have focused my attention on studying how using the concept of communities (collections of related interconnected pages) on the Web can improve the ranking of Web search results. The aim of the algorithm was to detect tight communities of related pages and then calculate the trustworthiness of each page in relation to the ranks of the rest of the Web pages in the community. (Research supported by a Schiff Fellowship.)

A Learning Spam Filter for the Wellesley Mail Server

Sara Sinclair '04, Computer Science
and French

ADVISOR: Scott D. Anderson,
Computer Science

Bayesian spam filters use statistical analysis and machine learning to categorize and

mark e-mail messages as to whether they are spam, allowing users to automatically process or delete them. The quick growth in popularity since their debut in August of 2002 is due to their high level of accuracy and ability to adapt to new trends in spam by retraining on misclassified e-mails. However, most Bayesian filters work only on personal computers instead of on mail servers, which can make implementation on a large network like Wellesley's difficult. This presentation will explore the conversion of a Bayesian filter into one that can run on the server side. The talk will also examine elements of the filter's design with the goal of increasing accuracy and speed on the server side, as well as discuss the results of testing the filter on the e-mail of members of the Wellesley community.

Problems with Hats: The Mystery of Colors

Paula F. Popescu '07, Physics and
Economics

ADVISOR: Mira Bernstein, Mathematics

In his article “Games People Don't Play”, Peter Winkler describes a game in which colored hats are distributed randomly to a team of players. Each player has to guess the color of his own hat based on observation of his teammates' hats and a team strategy devised in advance. For the team to win, at least one player has to guess correctly. Winkler considers only the case of two hat colors, but we will examine what happens when additional colors are allowed. We will approach this problem from two different perspectives. First, we will show how the team can devise a strategy using modular arithmetic. Next, we will give a geometric interpretation of the problem and derive some results about the set of all possible strategies. There are a lot more strategies than one might think!

Professor Peterman Picked a Peck of Patellin Plant Proteins (panel)

Elizabeth Le '04, Neuroscience and French,
Emily Pierson '04, Biological Sciences, and
Lotte Schlegel '04, Biological Sciences
ADVISOR: Kaye Peterman, Biological
Sciences

If you're reading this, your cells are dividing. Cell division is critical to living organisms and disruptions in this process can have devastating, even fatal consequences. When cells divide, the nucleus is replicated and partitioned along with the cytoplasm into two daughter cells. Plant cells, contrary to animal cells, divide from the inside out to form a rigid cell wall. Important questions address the function and interactions of proteins involved in cytokinesis. The patellin family, a group of six novel proteins, was identified in the Peterman lab. Patellin1 has been observed to localize to the cell plate and is hypothesized to play a role in membrane trafficking and cell plate formation during plant cytokinesis. We are investigating the function of patellin in *Arabidopsis thaliana* during cytokinesis by looking at its interactions with other proteins using a yeast two-hybrid system, as well as examining patellin mutant phenotypes. Results will be presented.

The Humanitarian Side of Science: Using Technology for Community Development (panel)

Vanessa Hsu Chen '04, Physics and Course
6 (MIT), Devyani Parameshwar '06,
Physics, Paulina Ponce de León Baridó '05,
Physics, Sophia Shluger '05, Economics,
and Laure-Anne M. Ventouras '05,
Biological Chemistry
ADVISOR: Robbie Berg, Physics and Amy
Smith, Edgerton Center (MIT)

Technology is the key to effective grassroots development. “Development-Lab” is a course that has given us the chance to be active participants in this process of technology driven change. By introducing us to the basics of international development and appropriate technology through

1:30 – 2:40

case studies and hands-on exercises, the class has given us the opportunity to partner with communities in Honduras, Brazil, and India to work in transforming theoretical solutions into reality. Over Wintersession we have visited these partner communities to identify problems that can be solved by using appropriate technology. By looking at technologies as diverse as the use of LEDs and charcoal briquettes made from bagasse as sustainable energy sources, we have been able to experience how science makes a difference in this world. Other technologies include the sustainable production of wheel chairs, the use of pottery for refrigeration, and numerous water purification techniques. We will be presenting our experience as volunteers in these three countries, the current research we are involved in that tackles the problems identified during our field trips, and thoughts on how simple technological change that is usually ignored by the developed world is celebrated by those living under \$2 a day. (Supported by the Office of the Dean of the College and the Office for Equal Opportunity through Student Research Grants, as well as MIT.)

Social Analysis

Conflict and Neutrality (paper session)

Private Mercenary Corporations: Implications for the Global Polity

Margaret Prystowsky '04, Political Science
ADVISOR: *Craig N. Murphy, Political Science*

The Westphalian model of international relations that places authority with the state is gradually evolving to reflect the forces of globalization and neoliberalism. The emergence of private market authority has led to the rise of a privatized military industry. Security services that were once governed and regulated by the state have been outsourced to private mercenary corporations made up of ex-special forces. These companies offer logistical support,

training, and command and control. I will address the implications of a privatized military industry for a state-centric conception of world politics, and theories of democratic accountability and legitimacy. A thorough understanding of the role of private military companies in global governance reveals both the potential benefits they provide for efficient conflict resolution and the problems they pose for state authority and human rights.

Female Agency in Aceh, Indonesia

Chiaki Nishijima '04, International Relations

ADVISOR: *Christopher Candland, Political Science*

Aceh, a peninsula on the northern tip of Sumatra, signifies the diversity and disunity of Indonesia. Acehnese separatists and the Indonesian military have been engaged in violent conflict for decades, while civilians have been subject to gross human rights violations. Contrary to popular beliefs about gender and Islam, the Acehnese are known for their powerful women. Historically, this Muslim province was ruled by a succession of women, including one who appears on the Indonesian Rupiah as the national heroine for her resistance against Dutch colonization. Today, some women have joined the ranks of the armed separatist movement. In the domestic sphere, the Acehnese word for 'house wife' means 'owner of the house.' Exploring female political agency in Aceh within the larger context of Indonesian national politics will lead to a better understanding of the causes of the conflict and the role of Acehnese women in resolving it. (Research supported by the Office of the Dean of the College.)

Switzerland's Historical Identity: Traditions of Isolation and Neutrality and Their Significance in a Changing Europe

Elizabeth Castagna '04, International Relations

ADVISOR: *Craig N. Murphy, Political Science*

Though Switzerland may appear simple, clean, and straightforward at first glance, there is more to this small country than its magnificent Alpine landscape, precision watches, gourmet cheese, and fine chocolate. The Swiss story is a complex and unique one of diversity, integration, and identity. Though the rest of Europe has changed significantly through periods of conflict and peace, Switzerland has emerged from centuries of struggles as an intriguing exception to European norms. I will present the highlights of my thesis research on the historical development and endurance of this small Alpine nation's unique national and international identity, focusing on the role of Swiss neutrality in major European conflicts and the compatibility of neutrality policy with internationalism. I will also include an evaluation of the current significance of Switzerland in Europe as it continues to stand apart from its neighbors, maintaining distinctive traditions of isolation and armed neutrality.

Women and Society (poster session)

Presenting Oneself to the Community: An Analysis of Women's Dorm Door Decorations

Susan Purcell '04, Neuroscience
ADVISOR: *Steven Schiavo, Psychology*

Do women's dorm door decorations vary with social context? This study, based on principles of environmental psychology, examined the association between how women choose to personalize their doors and the dormitory environment. Photographs were taken of twenty randomly selected women's doors in each of three different MIT residences. Twenty doors were randomly selected from one

1:30 – 2:40

large coed dorm, one large single sex dorm, and one small nontraditional coed dorm. Decorations were then analyzed for number of items, type of items (nine different categories), and “girliness”. Significant differences were found between the dorms in the following decoration categories: personal relationships, group membership, message board, identification, and girliness. Girliness was highest in the all-female dorm and lowest in the nontraditional coed dorm.

**Reimagining the Modern Spirit:
The Struggle to Be Oneself in
Virginia Woolf’s Milestone Novels,
Mrs. Dalloway, *To the Lighthouse*,
and *The Waves***

Jocelyn Cullen '04, English
ADVISOR: *Lisa Rodensky, English*

Virginia Woolf is perhaps best known for the revolutionary design of her craft: her style remains iconic in literary history. But even Woolf’s most radically structured novels—*Mrs. Dalloway*, *To the Lighthouse*, and *The Waves*—chart not only the evolution of the novel, but also the evolving search, within and among her characters, for a disposition that suits the modern experience of “self.” The challenge for Woolf and her characters is to negotiate the established “order”; to seek out an authentic relationship between “public” and “private”; to fathom the depth, the shape, of “the essential thing” in life and in oneself, and preserve it against all odds. At stake is the pursuit of meaning, order, connection, and coherence in an estranging and chaotic world. The presentation will offer an interpretation of how exactly Woolf questions and challenges the tides of modern life. (Research supported by a Schiff Fellowship.)

Justice Redefined (paper session)

Architecture as a Means for Social Justice

Cara Mae Cirignano '04, Architecture
ADVISOR: *Alice T. Friedman, Art*

Many architects strive to gain opportunities to make a real impact on peoples’ lives through skillful shaping of the built environment. Refugees and poverty-stricken populations are clients of these highly innovative and effective professionals who combine art and engineering with a deep passion for human rights. I will present the best of this work to the Wellesley College community with the goal of introducing a fresh perspective on the possibilities of this cross-disciplinary approach to humanitarian and socially conscious efforts.

Defining Justice: Understanding Context, Change, and Human Dignity

Elinor Ament '04, Philosophy and Political Science
ADVISOR: *Maud Chaplin, Philosophy*

Ideally, governments constantly strive for justice, but specific actions or laws may only be categorized as just or unjust within their historical context. We should neither judge practices of the past in terms of modern conceptions of justice nor judge the present by truisms from the past. Instead of establishing a standard for justice, the US Constitution prescribes a structure which allows for its continual redefinition. Rather than grounding its assertions of justice in an imagined consensus of the founding fathers, or in the pursuit of ideal justice itself, the Supreme Court must combine a reasoned study of the law, precedent, and social norms with a commitment to citizens’ visions of better justice. Satisfying a sense of personal and human worth is inherent to experiencing one’s society as just. Discriminatory attitudes and behaviors motivate individuals to work to change societal concepts of justice.

The Nonidentity Problem

Mary Hutton '04, Philosophy
ADVISOR: *Mary Kate McGowan, Philosophy*

Derek Parfit’s revolutionary approach to the question of personal identity has had a significant impact on moral philosophy. The problem of personal identity has two parts. First, one must determine what makes someone an individual person, and second, one must determine what makes an individual the same person over time. Parfit argues that if we continue to view personal identity as an absolute (i.e. all or nothing) fact, we will be unable to defend our conventional moral views. For instance, he argues that we may be forced to conclude that policies designed to benefit future generations (e.g. environmental protection) are logically unsound. Is an absolutist view of personal identity incompatible with conventional morality? And if it is, does Parfit give us an adequate alternative?

The Marriage Debates (panel)

Caitlin Andrews '05, Women’s Studies and Psychology, Loveleen Bindra '05, Political Science, Meredith Cowie '04, Computer Science, Emily Oldshue '06, and Anna Swartz '05
ADVISOR: *Rosanna Hertz, Women’s Studies and Jo Ann Citron, Women’s Studies*

This session will address (1) welfare recipients and recent legislation to advance marriage among this group; (2) gay unions/marriage, in particular, the recent gay marriage ruling in the Commonwealth of Massachusetts (which was given 120 days to interpret and implement the ruling). Papers will include analyses of state and federal policies and rulings.

3:00 – 4:10

Literature and the Arts

Theatrical Voices (short performances)

Portraits of Eden: The Wellesley College Community Speaks Openly about Diversity

Emi Kolawole '04, Theatre Studies and International Relations

ADVISOR: *Nora Hussey, Theatre Studies*

Portraits of Eden was created to provide a critical look at Wellesley's past, present, and future as a diverse and multicultural institution. By using the technique of Found-Text theatre developed by Anna Deavere Smith (incorporating both journalism and theatre), *Portraits of Eden* strings together a series of monologues taken from interviews conducted throughout the 2003-2004 academic year. The goal of this thesis project is to successfully use the theatre as a forum in which to present sensitive experiences and opinions about race and diversity at Wellesley.

Seule en Scène: An Exploration of the Monologue in French Theater

Morgan P. Carberry '04, French

ADVISOR: *Nathalie Rogers, French and Lawrence Rosenwald, English*

When one actor is left alone on stage, something magical happens. As part of an honors thesis on French theater, I created and performed my own one-woman show in French by weaving together a dozen of the greatest monologues from French dramatic literature. Today, you can journey with me through an excerpt of this production as I explore contrasting characters and literary works. Through live performance, we can experience how the monologue redefines the relationship between the actor, audience, and author of a play, and we can also discover that the language barrier is not necessarily an obstacle to theatrical communication.

Scripting Shyness: A Quirky Tragicomedy Involving Lonely People

Jessica Clegg '04, English and Classical Civilization, Katy Howard '04, English, and Leslie York '04, English and Classical Civilization

ADVISOR: *James Noggle, English*

Every seven minutes there is a natural lull in conversation. For those with Social Anxiety Disorder, that "lull" can last a lifetime. This screenplay, entitled *Step, Shuffle, Hop* is intended to convey the insular lives of two such socially awkward individuals and their tentative steps towards self-improvement. These steps involve gender confusion, questionable fashion choices, and Irish dancing. The author of this screenplay seeks to emphasize the comic and perverse elements of the characters, and the agony of failing to develop the appropriate quip in conversation. Will Maureen fulfill her dreams of *Riverdance* and of her gay neighbor? Will Charles successfully come to terms with his unspoken passion for his public speaking instructor? Will both these characters realize the limits of affection that they place upon themselves? The presentation will include an introduction, plot overview, and a dramatic reading of an excerpt from the screenplay featuring both students and faculty.

Musical Roots (presentation/demonstration)**From Beethoven to Ligeti: The Incorporation of Folk Music in Art Music**

Jonina Allan '04, Music and Ariel Gallant-Bernstein '04, Music

ADVISOR: *Arlene Zallman, Music*

Music is an art form deeply rooted in human existence. Folk music is perhaps the most organic human expression; it captures the essential sounds of the tragedy and comedy of peasant life. Composers of concert music have understood the universality of folk music, and they often use it both through literal reproduction of folk songs and the recreation of the folk affect. Folk song has been

the backbone and sustaining force in classical vocal literature. The vocal music of composers such as Dvořák, Mahler, and Beethoven reflect the variety of ways in which composers have incorporated folk song. The collection of Hungarian folk music by Bartók and Kodaly in the early twentieth century had a transformational effect on successive generations of Hungarian composers. Gyorgy Ligeti's viola sonata, written in the 1990s, is a diverse compilation of extractions from various folk traditions, including Hungarian and Romanian. This lecture/demonstration will include excerpts of this art music and a discussion of the techniques and thought processes of these influential composers.

Memoir, Self, and Revelation: Two Original Readings (readings of original works)

Stacy Roalsen '05, Philosophy and Elizabeth Edmonson '05, English

ADVISOR: *Alexandra Johnson, Writing and Lawrence Rosenwald, English*

The writing of memoir is both exhilarating and troubling. It is exhilarating to step back into one's memories, to pull from the past forgotten details, and to shape these memories into a compelling narrative. Yet the writing of memoir also brings with it troubling questions of memory concerning truth - what responsibility do we have in relating the truth of our experiences, we often ask? In this presentation, we will read excerpts from our memoirs, then lead a discussion about this genre of writing. The following topics will be integral to our discussion: How do the stories we tell about ourselves and each other shape our identities? In what way do we create ourselves through the stories we tell? Is there a "truth" in our experiences to which we must remain faithful? We hope that with these questions we will jumpstart a lively discussion about the writing of memoir.

3:00 – 4:10

Chrysalis

Juanjuan Blout '05, Economics
 ADVISOR: *Adam Schwartz, Writing*

My whole life I believed my father was an illiterate zombie and that my mother was a tramp because she had been raped and brought me, a girl, to this world and then let me suffer. I could never step out of the rice fields, or this cruel hamlet in Southeast China, I thought, because this was where I belonged, and I would hate and degrade myself forever. I was a chrysalis floundering to get out of its cocoon. I fought back, followed my heart and fled the hamlet. My parents disowned me. I gave up the state-assured teaching job and drifted pennilessly on the street. I made a fortune but then I left everything behind, including my country. And today, at Waban Lake, finally I saw the chrysalis turning to a butterfly.

Multicultural Research

**Dance, Music, and Song:
 Cross-cultural Perspectives
 (paper session)**

The Sacred Music of Vodou and Candomblé

Krista Kateneva '06, Latin American Studies
 ADVISOR: *Gerdès Fleurant, Music and Kera Washington, Music*

Vodou, one of the predominant religions of the Haitian people, and Candomblé, Vodou's equivalent in Brazil, were born of the encounter between African and Western religious traditions and practices. Beginning in the sixteenth century, the people from West and Central Africa brought to the Americas several closely related religious traditions, which were then synchronized with Western religions. In both Vodou and Candomblé, one of the central elements of the ritual is music. Music creates the appropriate atmosphere, accompanies the songs and prayers directed to the spirits, supports the dances related to each deity, and most impor-

tantly, it is believed to facilitate possession – one of the goals of the ceremony. This presentation gives the audience a brief overview of the importance and the role of music in ceremonies of Vodou and Candomblé.

Walking in the Mist: China's Minority Policies Overcast Authentic Minority Dance

Ching Jen Lum '04, Chinese Studies
 ADVISOR: *William A. Joseph, Political Science and Yuan-Chu Ruby Lam, Chinese*

Shortly after coming to power in 1949, the Chinese Communist Party sent cadres to ethnic minority villages to collect folk songs and dances promoting acceptance and understanding between China's 55 minority groups and the "Han" majority. The start of the Cultural Revolution (1966-1976) ended all teaching of minority dance in major cities in favor of revolutionary ballets; only later did the collection and teaching resume. Prestigious dance academies in the cities recruited amateur performers from the villages. These academies also established a broad minority dance curriculum. Locally in the villages, theaters were built to house minority dance performances. Has this push toward professionalization truly benefited the minorities? Or does current policy further extend the power of the Chinese government, while hindering the authenticity of minority folk dance? My presentation examines the history of China's minority policies, particularly their influence over minority dance, and the future of authentic minority existence.

"Arirang": The Cry of Korea

Kiwon Sue '05, International Relations
 ADVISOR: *Y. Tak Matsusaka, History*

According to Stephan K. Roney of the *Korea Herald*, "So far as we know, the word 'Arirang' means nothing. It is nameless sorrow. But it is the refrain to an entire genre of Korean folk lyrics. Most about lost love; all about loss." As a majority of Koreans in Korea empathize in such a manner when listening to this national folk song, "Arirang" is still

undeniably *the* song of the Korean people. Its meaning has been shaped by the experiences of the people and the nation throughout history. Today, "Arirang" is sung at almost every event in which the Korean spirit is represented, and inspires the names of numerous Korean shops and restaurants worldwide. How did this phenomenon come about? What meaning does "Arirang" hold for the Korean people? This presentation explores these questions through a look at the history of the song and its place in the Korean experience.

Tinsel Town Tunes

Tina Romero '06, Cinema and Media Studies and French
 ADVISOR: *Karen M. McCormack, Sociology*

Music is a medium through which people can communicate, but how this happens is a complex phenomenon, given the subjective interpretations that the art form allows. Over the past century, cinema has also become an influential form through which humans express and exchange ideas, and music has played a crucial role in the development of cinema's popularity. In combining music with cinema, however, music seems to lose one of its most attractive qualities—its ambiguity. Filmmakers and film viewers have developed almost universal expectations and understandings about the purpose and meaning of music in cinema so that film scores are often very formulated. In this presentation, I will examine the role of music in film and examine the reasons for the development of the formulaic use of music, and in particular, the way that Hollywood is structured regarding the use of music in film.

3:00 – 4:10

Masks: Bishonen, Magic Girls, and Cosplay (panel)

Hidden Desires: Transformation, Bishonen, and Cosplay

Sarah Lee '04, English, MyungJin Lee '04, Economics, Candy Wong '04, Chemistry, and Sylvia Navato '04, Classical Civilization

ADVISOR: *Carolyn Morley, Japanese*

Japanese animation, known as anime, has garnered unprecedented popularity outside Japan. Unlike American cartoons, anime reaches people of all ages and backgrounds, and has become one of Japan's most successful exports. This panel will highlight a few of the most salient features of anime in an attempt to widen the audience's perspective on Japanese popular culture.

Henshin Shiyō ("Let's Transform!") – Metamorphosis is a thematic device particular to anime that indulges in artistic liberties to explore and expose fantasies and fears through physical transformation of the body.

Kira Kira ("Sparkle, Sparkle") – *Bishonen* ("pretty boys") is an integral part of anime. This presentation will explore the impact of *bishonen* on the general pop culture.

Soul Dreams: Eastern Actors, Western Masks – This presentation deals with differences between American and Japanese fan cultures, their history, and the development of cosplay, the act of dressing or acting as a character.

The Power of Religion and Ritual (paper session)

"Go Down, Moses": Christianity, Conjure, and Empowerment in the Slave Rebellions of Denmark Vesey and Nat Turner

Moira Pulitzer-Kennedy '04, Religion
ADVISOR: *Stephen A. Marini, Religion*

Denmark Vesey's 1822 South Carolina slave conspiracy was the largest planned slave insurrection in the history of the North American colonies or the United States. Nat Turner's rebellion, which took place in Virginia in 1831, became the cause of death for many. Through an examination of their experiences and strategies, I will discuss the ways in which Vesey and Turner blended American evangelical Christianity with elements of African religion and philosophy to create a unique African American theology which they used to justify insurrection. My presentation will distinguish between various African and Christian elements in slave religion, and explore the ways in which their creative transformation produced an imperative for rebellion.

A Gendered Identity Crisis: Masculinity and Religious Practice in Puritan New England

Anne Catherine Savage '04, History and Classical Civilization
ADVISOR: *Nathaniel Sheidley, History*

Although men and women worshipped together in early New England, the sexes experienced religion in strikingly different ways. Puritan men faced a profound and gendered identity crisis in which they were forced to come to terms with the intersection, and oftentimes collision, of their secular and religious selves. I used men's diaries, conversion narratives, poetry, and sermons as lenses through which to explore masculinity in Puritan New England at four critical life stages: marriage and the creation of a family, the conversion process leading to church membership, the call to an occupation, and facing death. Even though Puritan men were sure to confront strain in fulfill-

ing their masculine roles in both the religious and secular spheres, these roles were not mutually exclusive. In most cases, men were able to develop effective coping mechanisms to manage their internal struggles with the matter of their masculinity. (Research supported by a Schiff Fellowship.)

Changing Waters: Infant Baptism during the Reformation

Audrey Ferguson '04, History and Religion
ADVISOR: *Stephen A. Marini, Religion*

On the eve of the Protestant Reformation, the issue at the forefront of theologians' minds was not infant baptism. The definition of this sacrament, though highly contested in the infancy of the church, had been a settled issue for over three centuries. However, during the Reformation, the questions of whether infants should be baptized and the efficacy of infant baptism as a sacrament were highly debated. From the Anabaptists in Switzerland to the Lutherans in the Northern German state to the Calvinists in parts of France and Switzerland, each reforming group interpreted infant baptism differently. How did these theologians view infant baptism and what did it mean to their followers? Why was infant baptism such a point of contention among the various reforming traditions? How did the sacrament of infant baptism change during the course of the Reformation? My research focuses on the writings of reforming theologians including Luther, Calvin, Menno, and Sattler as well as others. I attempt to discover how the understanding of infant baptism changed, why it was such a volatile issue, and why these debates over infant baptism often ended in bloodshed.

3:00 – 4:10

Science and Technology**Stable Isotopes in Trophic Ecology: Are You What You Eat? (poster session)****Stable Isotopes in Trophic Ecology: Are You What You Eat?**

Carol Niemann '04, *Biological Sciences*,
Madeleine deBlois '04, *Environmental Studies*,
Youlim Yai '04, *Biological Sciences*,
and Sarah Lucchesi '04, *Biological Sciences*

ADVISOR: Diane M. O'Brien, *Biological Sciences*

Natural differences in stable isotope abundance ($^{13}\text{C}/^{12}\text{C}$; $^{15}\text{N}/^{14}\text{N}$) can be used to infer animal diets. Carbon isotope ratios ($\delta^{13}\text{C}$) reflect the plants at the base of an animal's food chain: C_4 plants (e.g. corn, sugar cane) have the highest $\delta^{13}\text{C}$, whereas C_3 plants (e.g. Wheat, soybeans) have the lowest $\delta^{13}\text{C}$. Nitrogen isotope ratios ($\delta^{15}\text{N}$) increase with each step up a food chain. We analyzed $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in a fingernail sample from each student. Students reported their three top dietary protein sources. We ranked those sources by predicted $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, and plotted these weighted rankings against actual $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$. Fingernail isotopes were highly correlated with dietary rankings. The class reflected a mix of C_3/C_4 plants, and a trophic level's range of $\delta^{15}\text{N}$ (with the vegan the lowest). Isotopes are used in paleo-human dietary reconstruction; we found that isotopes reflect a wide range of diets with high fidelity.

The Powerful yet Malleable Environment and Its Impact on Life Systems (paper session)**The Flight of West Nile Virus: A Study of Affected Bird Populations**

Naomi Wells '06, *Environmental Science*
and Miranda Brintnell '07

ADVISOR: Marcy Thomas, *Biological Sciences*

In 1999, West Nile Virus (WNV) first

arrived to the United States. The virus proliferated across the country, with over 250 human cases last summer. Although the disease harms humans and horses, bird species were the principal target. Along with increasing mosquito populations, birds' migratory patterns primarily contributed to its spread. By some estimates, WNV killed almost half of the bird population in some states. Intensive spraying campaigns were implemented to control mosquito populations with unknown impacts on bird populations.

Despite funding spent on studying WNV, the virus' long-term effects harbor the potential for ecological disaster. Will spraying campaigns mitigate this damage or merely embellish it? We created a cohesive answer to this question using scientific data provided by different health organizations. Our computer models outline the possible immediate and long-term futures of several bird species given current trends in WNV transmission and increased pesticide use.

Phosphorus Levels in Lake Waban before and after the Paintshop Pond Cleanup

Julie Wright '04, *Biological Sciences*
ADVISOR: Marianne Moore, *Biological Sciences*

Phosphorus is one of the key elements necessary for life. In freshwater bodies, phosphorus is usually the limiting nutrient, and when it is present in excess amounts, it often causes water quality problems and algal blooms. Lakes that receive excess phosphorus and exhibit algal blooms are called eutrophic. Recently, the Paintshop Pond area was renovated, and a new wetland was planted there. Lake Waban is adjacent to the disturbed area, and it is already mildly eutrophic due to drainage from a large suburban watershed. Ten years ago, a phosphorus budget was constructed by Pavla Zakova '94. That phosphorus budget will be compared to a contemporary budget using data collected within the last year. In this presentation, results of

the new phosphorus budget will be discussed in light of the current health of Lake Waban, the effects of soil disturbance due to the Paintshop Pond cleanup, and the possible 'sponge' quality of the restored wetland.

Sustainable Urban Community Gardening: The Challenge of Elevated Lead Concentrations in Soil

Kristen Blanton '04, *Environmental Studies*

ADVISOR: Dan Brabander, *Geology*

The Food Project is an organization that promotes sustainable development and community cooperation by bringing together thousands of youths and adults to grow organic vegetables on urban land that has been transformed from vacant lots into lush, city farms. Recently, however, the Food Project, in collaboration with UMass-Boston and Wellesley College, has found that in some of their gardens the concentrations of lead in the soil can be as high as three times the EPA's "safe level". Our research is focusing on three main questions: can we fingerprint the main source of the lead in these gardens, if the soils are remediated will they remain lead free, and is the lead in these soils mobile and accumulating in the produce. The answers to these questions will provide insights into assessing the severity of the lead in these soils while providing a framework for designing successful remediation schemes.

Evolution and Differentiation of Endemic Insect Populations in Galápagos

Purnima Mandal '04, *Biological Sciences*
ADVISOR: Andrea Sequeira, *Biological Sciences*

Island archipelagos provide excellent model systems in which to study evolving populations. Their separation from the continent provides opportunities for isolation, promoting differentiation and potentially speciation. Larger islands provide topographic and ecological diversity that foster differentiation between populations through adaptation or isolation by distance within the islands. One archipel-

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ago that has played a fundamental role in the history of evolutionary biology is certainly Galápagos, which is the largest, most complex, and most diverse archipelago remaining in the world still largely in pristine condition. In our study, DNA sequences of rapidly evolving mitochondrial genes will be used in an attempt to infer patterns of population structure and assess differentiation in four populations of the weevil *Galapaganus galapagoensis*, endemic to the oldest island of the Galápagos archipelago. We will discuss the relative role of ecological diversity, habitat associations, and geographic and geologic factors in shaping population structure and promoting speciation in these weevils.

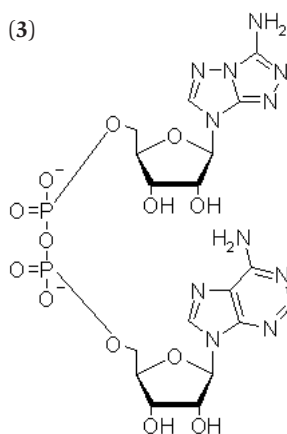
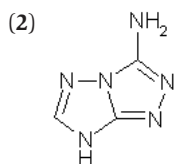
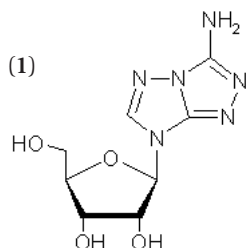
Chemists Tackle Biology: Chemical Approaches to Medical Problems (paper session)

Synthesis and Purification of a Possible Anticancer Agent

Kristin A. Moy '05, Biological Chemistry
ADVISOR: David R. Haines, Chemistry

Nucleoside analogs have been shown to have anti-tumor and anti-viral properties and can be synthesized through various means. One method of synthesis is through the ribosidation of nitrogenous bases. Enzymatic ribosidation was chosen as the method of choice as chemical ribosidation resulted in unwanted isomers. The adenosine analog, 3-amino-7-β-D-ribofuranosyl-1,2,4-triazolo-1,2,4-triazole (1) was synthesized via ribosidation at N-7 of the bicyclic system, 3-amino-1,2,4-triazolo-(4,3-b)-1,2,4-triazole (2). Enzymatic ribosidation of 2 was accomplished using NADase and resulted in specific ribosidation at the N-7 position. The ADP-ribofuranosyl-3-amino-1,2,4-triazolo-(4,3-b)-1,2,4-triazole was then reacted with phosphodiesterase-I and 5'nucleotidase to hydrolyze the phosphates. This resulted in a mixture of adenosine and 1. Separation was accomplished using reverse phase chromatography. The structure of the product was confirmed through coupled C-NMR

studies. (Research supported by a Staley Grant.)

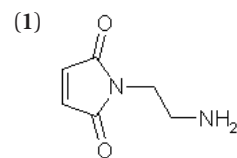


A Chemical Approach to the Treatment of Diabetes

Meghan Scobee '05, Biological Chemistry and English
ADVISOR: David R. Haines, Chemistry

Type II Diabetes affects nearly 16 million Americans and is caused by an acquired insulin resistance. Activation of glucagon-like peptide-1 receptor (GLP-1R), a G protein coupled receptor, leads to cAMP production and a signal cascade event resulting in the transcription of the insulin gene. The natural agonist of GLP-1R is the 30 residue peptide GLP-1. The effectiveness of GLP-1 as a possible treatment for type II diabetes is hindered by its short half-life *in vivo* (15 minutes). We have prepared a maleimidoethylamine tether

(1) to which we have attached the three N-terminal amino acids of the glucagon-like peptide-1 (GLP-1). This tethered peptide can be delivered to the proposed active site of the GLP-1 receptor, GLP-1R, by attachment to a truncated form of GLP-1 or a truncated form of a second natural agonist, exendin-4. Exendin-4 is a thirty-nine amino acid peptide found naturally in the saliva of the Gila monster and is a full agonist of GLP-1R. Appropriate truncation of exendin-4 produces an antagonist of GLP-1R with binding comparable to the exendin-4. Preliminary biological studies of the agonist tethered to the truncated exendin-4 will be presented. (Research supported by the Robert and Karl Staley Fund.)



The Effects of Gold Nanoparticles on Hydrogel Phase Transitions

Frances Y. Pong '05, Chemistry
ADVISOR: Nolan T. Flynn, Chemistry

Hydrogels are cross-linked, three-dimensional networks of polymer chains. Some types of hydrogels undergo a phase transition in which the polymer network contracts in response to an environmental stimulus as observed in Figure 1. The contraction leads to the hydrogel expelling its contents. Such physical properties make hydrogels ideal biomedical materials, primarily as implantable drug delivery devices, and require careful examination. In my work, gold nanoparticles are formed within *N*-isopropylacrylamide hydrogels with various types of cross-linking agents. These materials contract at a particular elevated temperature, known as the phase transition temperature. Nanoparticle addition causes alteration in hydrogel volume, color, and phase transition temperature. Similarly, alteration of the hydrogel composition enables tuning of

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the size and properties of the gold nanoparticles. Results from the synthesis and phase transition behavior of hydrogels will be discussed.

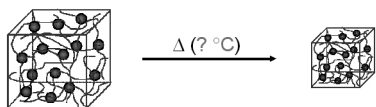


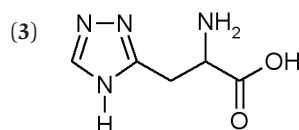
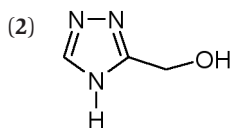
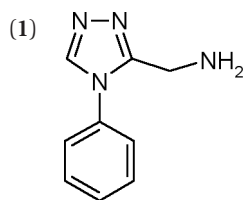
Figure (1): Illustration of the phase transition of metal nanoparticle-containing stimuli-responsive hydrogels.

Preparation of Triazole-Based Molecules as Precursors to Biologically Active Compounds

Alisha Weight '05, Chemistry

ADVISOR: David R. Haines, Chemistry

Analogues of physiological molecules can inhibit biological processes such as cell replication and regulation of blood glucose. Synthesis of 3-substituted-[1,2,4]-triazoles serves as a multipurpose base for the preparation of analogues of purine and histidine. Modification of purine (one of the bicyclic ring systems of nucleotides and DNA) has been explored via numerous pathways. For example, 3-aminomethyl-4-phenyl-[1,2,4]-triazole (1) can be prepared through reaction of glycine ethyl ester and hydrazine, followed by ring closure using ethyl phenyl formimidate. Alternatively, 3-hydroxymethyl-[1,2,4]-triazole (2) can be prepared through the high pressure reaction of [1,2,4]-triazole and formalin. Subsequent additions to the side chain are progressing towards a purine analog. This second method is also important for the synthesis of an analogue of the amino acid histidine (3). Chlorination of 2 followed by addition of diethyl formamidomalonate and hydrolysis are currently being investigated. (Research supported by a Staley Grant)



Social Analysis

Economics of Government Regulation (paper session)

What Happens When the Unemployment Insurance Trust Fund Goes Bankrupt?

Yin Zhou '04, Economics

ADVISOR: Phillip B. Levine, Economics

The Unemployment Insurance Trust Fund in many states is in financial crisis. The economic recession of the late 90s exerted considerable strain on the solvency of the trust funds, depleting their resources. Some states' funds, including those from Minnesota, North Carolina, and Missouri, are on the verge of bankruptcy. Trust funds in New York and Texas have already reached bankruptcy. Why are these states in such financial distress? This presentation will shed light on some of the fundamental problems associated with unemployment insurance financing and reveal the effects of bankruptcy on workers' benefits and employers' tax rates.

The Effect of Exchange Regulation on the Price Volatility and Trading Volume of Financial Derivatives

Jennifer L. Schwalbenberg '04, Economics and Chinese Studies

ADVISOR: Eric D. Hilt, Economics and Ann D. Witte, Economics

As more financial exchanges become publicly held companies, as opposed to privately held entities, it is important to understand the relationship between an

exchange's regulation of a financial instrument and this instrument's performance. The aim of this project was to isolate the effect of margin requirements, or the amount of cash or securities necessary to be deposited before an individual can commence trading, on trading activity. The Nikkei 225 future was chosen because as the Osaka Securities Exchange gradually increased margin requirements from 1990 through 1994, trading volume fell 45%. In response, they gradually decreased margin requirements from 1994 through 1997. To measure the effect of the changes in regulation, the price volatility and trading volume of the Nikkei future were compared to that of a comparable index future traded in the U.S., the S&P 500 future, during the same period. (Research supported by the Office of the Dean of the College.)

Does Reducing Stigma Increase Food Stamp Take-up Rates? A Study of Electronic Benefit Transfers (EBT)

Kathryn Bradley '04, Economics

ADVISOR: Melissa S. Kearney, Economics

The Food Stamp Program (FSP) is designed to assist low-income households with the purchase of food. Traditionally FSP benefits have taken the form of coupons that could be exchanged at participating stores. Legislation passed in 1996 required that by October 2002, all states deliver food stamp benefits through an electronic benefit transfer (EBT), instead of the conspicuous paper coupons. Program participants are given an EBT card that uses an on-line system and operates much like a debit card. EBT was expected to reduce the stigma that had been associated with the paper coupons and increase participation rates as a result. Taking advantage of state level variation in the timing of the implementation of EBT systems, I use administrative data to study how this new technology affects take-up of the program by eligible households. I examine the participation effect separately for different race, ethnic, and income groups.

3:00 – 4:10

Our World at War: Examining the Origins and Consequences of Contemporary Conflict (panel)

Cassandra Aulner '04, International Relations, Narges Bajoghli '04, International Relations, Yelena Biberman '04, International Relations, Jenna Bressel '04, International Relations and Jewish Studies, Sarah Liebschutz '04, International Relations, Farrowe Yi-Shiu Pan '04, Peace and Justice Studies, Elizabeth Phelps '04, History and Political Science, and Liza Sohn '04, Spanish and International Relations
 ADVISOR: *Will Hitchcock, History*

Although much of the world's attention over the past year has been focused on the US intervention in Iraq, there are over 50 other armed conflicts going on in the world today. Drawing on work done in International Relations 301, this panel will discuss four recent conflicts: the genocide in Rwanda, the Israeli-Palestinian conflict, the century-old sectarian conflict in Northern Ireland, and the recent decade of war and terror in Chechnya. Each of these conflicts offers important evidence about how wars start, why they can last so long, and how they affect the lives of citizens caught in the cross-fire. The panel will place these four areas of conflict into the broader context of global insecurity and violence, and pose the question: what must be done to bring peace to our war-torn world?

Women's Notions of Art and Beauty (paper session)

Standards of Beauty in the African Diaspora: Latin America

Loren Days '04, International Relations
 ADVISOR: *Pashington Obeng, Africana Studies*

As a result of the mixing of races that occurred during the epoch of slavery in Latin America, the elites of Latin American colonies created hegemonic ideologies to perpetuate white power and privilege. Standards of beauty were embedded in a culture's values, beliefs, and ideologies, creating a system of power relations based on Caucasian physical features. This ideology continues to permeate throughout Latin American society today in standards of beauty. Join me as I discuss how women have internalized standards of beauty in connection to belonging to different social classes, ethnicities, professions, generations, or educational backgrounds. (Research Supported by Wellesley College Grant.)

Stitch and Tell: The Needlepoint Kneelers of Trinity Church in the City of Boston

Barbara Elfman '05, Art History
 ADVISOR: *James O'Gorman, Art*

In the spring of 2003, I took a course from Professor James O'Gorman on art and architecture in the city of Boston. We visited many historic buildings, including Trinity Church on Copley Square, a building designed by America's first celebrity architect, H.H. Richardson, and containing the first large painted decorative program in the United States. Despite the overwhelming power and majesty of the acclaimed spatial environment, as one who has long studied and executed needlepoint I was attracted to the coverings of the kneelers at my feet. They continue a strong tradition of Boston crafts and add their own subtle dimension to the spiritual and artistic ambience. Since that time, I have been involved in an independent study with Professor O'Gorman researching the history and stories behind the kneelers. I spent the summer of 2003 investigating and met with 96-year old Margaret Gamble who began the project to bring the tradition of individually made needlepoint kneelers to Boston. I have contacted 86 parishioners and over half have shared their stories. One woman borrowed her pattern from the ceiling design. Another serves to memorialize a young woman whose ashes are spread on Cape Cod. Through intricate needlework and heartfelt words they capture the Boston spirit.

4:30 – 5:40

Literature and the Arts**Mozart Piano Quartet in G minor K478 (performance)**

Leah Morse '04, Cinema and Media Studies, Jonina Allan '04, Music, Ronnie Gosselin '07, and Lael Greenstein '04, Religion and Latin American Studies
 ADVISOR: *Nancy Cirillo, Music*

Amadeus Mozart's *Piano Quartet in G minor K478* is one of Mozart's most recognizable pieces for chamber ensembles. Considered revolutionary for its incorporation of the piano as an equal partner, it became a model of technical and emotional musicality that has lasted as such until today. Our quartet will perform all three movements, Allegro, Andante, and Rondo: Allegro. We have been rehearsing and performing each of the movements throughout the year, and this will be the culmination of our work.

Greatness, Courage, Blood: Putting Together *Henry IV, Part 1* (presentation/performance/panel)

Hartley Miller '04, French and Classical Studies, Alison Buchbinder '05, American Studies and Theatre Studies, Christiana Mollrem '06, Theatre Studies, Meredith Bough '06, Theatre Studies and Russian Area Studies, Ailin Conant '04, Theatre Studies, Andrea Hodgins-Davis '04, Biological Sciences, Emily Saunders '06, English, Rebecca Floyd '06, and Kit Gette '04, Classical Studies
 ADVISOR: *Nora Hussey, Theatre Studies*

A kingdom wracked by civil war. A boisterous fat knight, an aging king, a delinquent prince, and an honor-obsessed rebel, all caught in the struggle for an ill-gotten crown. And lots and lots of stage blood. Welcome to the Shakespeare Society's 2003 production of *Henry IV, Part 1*. What are the challenges of producing a Shakespeare history? What makes a Shakespeare Society performance unique? How was the design of this production conceived and realized? A panel of student

artists, including the director, dramaturg, designers, technicians, and actors, comments on the process of bringing Shakespeare's *Henry IV, Part 1* to today's Wellesley stage.

Multicultural Research**Minority Identity in America (paper session)****Beyond Black and White: Native American Perceptions of Race during the Civil War**

Lauren Ullman '04, History
 ADVISOR: *Nathaniel Sheidley, History*

Native Americans have always been members of an ambiguous racial category defined by whites. During the Civil War, however, a new phenomenon occurred. This era allowed Native Americans to define themselves in new ways. My research explores how Native Americans, both with and without European ancestry, manipulated their racial identities in order to better their socioeconomic and political status. A close reading of the letters and memoirs written by officers and enlisted men during and after the Civil War demonstrates that Native American soldiers defined their race strategically in response to particular events. Individuals with different backgrounds manipulated their identity in similar ways to accomplish a similar goal of social betterment. This fluidity in the concept of race proved short-lived. Native Americans across the country took advantage of this opportunity and, for a brief time, they became almost equal.

An American Asylum: The Effects of Immigration Policies on Cambodian Refugees

Cecilia A. Fong '04, Peace and Justice Studies and Political Science
 ADVISOR: *T. James Kodera, Religion*

After the fall of Saigon in April 1975, while American troops pulled out of Vietnam, the Khmer Rouge marched into Phnom Penh and proclaimed a new

regime. Signaling a recurrence of Hitler's "Holocaust," Cambodia under Pol Pot resulted in what came to be known as "the Killing Fields." Those who survived sought refuge elsewhere, only to encounter increased legal reactions. The United States is one such country whose laws have tried to accommodate these survivors. However, do the structures and provisions of international and domestic refugee policies assist the refugee community? Is this justice for Cambodian refugees or Pol Pot's regime? Through interviews with the refugees and their supporters, I offer an interim report on the hopes of the refugees and the obstacles that stand in their way. They may rewrite an important chapter in Asian-American history.

Science and Technology**Using Force to Get Your Way (paper session)****Laser Cooling and Trapping of Rubidium Atoms**

Kali Wilson '04, Physics and Christina Baer '03, Physics and English
 ADVISOR: *Glenn Stark, Physics and Robbie Berg, Physics*

In laser cooling and trapping, a gas of atoms is confined in space by laser light and cooled to temperatures less than 1/1000 of a degree above absolute zero. Currently atoms can be cooled to nanokelvin temperatures, the lowest temperature of matter ever achieved. This technique was developed in the early 1990s and led to a Nobel Prize in 1997. Since 1999, laser cooling and trapping has been an ongoing project in the Wellesley Laser Laboratory. Rubidium atoms were successfully trapped in August 2002; however, the experimental setup was unreliable. Our research centers on redesigning the trapping apparatus to increase its reliability. Following the development of a stable experimental setup, the atoms' velocity distribution in the trap will be measured using the time

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of flight method. The resulting data allows the precise calculation of the trapped atoms' temperature.

Investigations Using a Double Optical Tweezers System

Alyssa Meyer '04, Physics
ADVISOR: *Ted Ducas, Physics*

Optical tweezers use a tightly focused laser beam to exert an extremely localized force on microscopic particles. These particles are pulled into the focus of the laser beam and “trapped”. I have modified the existing tweezers setup at Wellesley to form two optical traps which can be moved independently. This greatly expands the range of research that is possible with such a system. I am working to optimize the double trap system and calibrate it using polystyrene microspheres. As a particular application, I am studying the forces of adhesion between microspheres coated with Streptavidin and Biotin. (Research supported by a grant from the Howard Hughes Medical Institute.)

Aging Effects in Suspensions of Silica Particles

Seila Selimovic '04, Physics and German
ADVISOR: *Yue Hu, Physics*

In our study of the aging phenomena in silica suspensions, we subjected several suspensions of silica particles in various silicone oils, mineral oil, and water to different shears and stresses, and measured their viscoelastic properties as a function of time. Samples based on silicone oil, initially of a pasty consistence, became fluid-like after a period of about three weeks. Aqueous samples aged much faster than these oily samples. After their respective aging period, all samples are nearly Newtonian and flow very well. Only samples containing mineral oil did not exhibit any changes in viscosity and elasticity. We will discuss a possible mechanism for these aging behaviors. (Research supported by a Radcliffe Fellowship, a National Science Foundation grant (no. DMR-9971432), and a Wellesley College Dean of the College Research

Grant. We thank D.A.Weitz, Harvard University, for the use of lab facilities and Paula Popescu for assistance with data analysis.)

An Investigation of the Classic “Inertia Ball” Demonstration

Oana Ivan '07 and MaryBeth Mills-Curran '07
ADVISOR: *George Caplan, Physics*

Does string theory pique your interest? Discover old-time string theory! The “inertia ball” demonstration involves a mass hung from a string with an identical string tied to the bottom of the mass. The lower string is pulled either slowly or with a jerk, and some surprising things happen. Come see how this works! A theoretical model of this demonstration predicts even more interesting behavior. The model makes some assumptions about the properties of strings. We tested a number of strings to see whether they come close to matching the theoretical assumptions. We will describe the results of our investigations and perform several exciting demonstrations.

Exploring the Depths: Old and New (paper session)

Structural History of the Cambridge Argillite via Boston-Area Tunnels

Kristin Morell '04, Geology
ADVISOR: *Meg Thompson, Geology*

Despite decades of study, the structural history of the Boston Bay Group in Boston Harbor, Massachusetts is poorly known due to scarce surface exposures. This project aims to fill this gap by clarifying the structural geology of the Cambridge Argillite based on subsurface data. Bedding and joint measurements from several tunnels combined with fabrics in available core borings reveal a more complete sequence of structural events than previously documented. Bulk geochemistry analysis of representative argillites from these tunnels will determine whether stratigraphically significant chemical variations are present. The findings of this project will be used to

produce a revised geologic map of the Boston Basin using ArcGIS.

A Tale of Two Formations: Comparing Triassic Microvertebrate Assemblages in New England and the Southwestern United States

Hillary Jenkins '04, Geology
ADVISOR: *Rebecca Mattison, Geology*

The Snyder Quarry, located in the remote regions of northern New Mexico, is a paleontological site teeming with vertebrate fossils. Within this Upper Triassic (mid-Norian) sandstone and mudstone locality lay a diverse microvertebrate fauna which hold important clues about environmental conditions during the Triassic and may represent one of the oldest wildfires documented in the region. Regional comparisons between the Snyder Quarry and the Locketong Formation, an Upper Triassic (Carnian) shale and sandstone unit spanning much of New England, provide further information about the microvertebrates of Triassic North America. Because the two formations are relatively similar in age, they yield contemporaneous fossil assemblages that can be correlated and compared. From the Southwest to the Northeast, these two field sites and their microfossil assemblages give us a glimpse into the world of the creatures that roamed North America over 200 million years ago.

Cross-cultural Caving: Learning about the Organizations and Technique of Italian Cave Explorers

Margaret Renwick '04, Italian Studies and Cognitive and Linguistic Sciences
ADVISOR: *Flavia Laviosa, Italian Studies*

“Libera!” “Parto...Recupera!” These were the first words I learned in the *corso di speleologia* – caving course – I took during my year abroad in Bologna. Quickly, I passed to more complicated vocabulary, like *frazionamento*, as I realized how great the differences are between Italian and American caving. Speleology, the science of caves, was first defined in the late 1890s and today is a worldwide endeavor with intriguing differences among

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countries. Over Wintersession, I returned to spend three weeks caving and researching the murky world of cave politics, exploration, and technique. I focused on Italy's speleology education system, interesting to me because it has no American equivalent. This presentation will showcase my experiences and preliminary findings following nine months of immersion in Italy's *cultura sotterranea*. Through research and experience with its *scuole di speleologia*, I hope to create an educational exchange between the Italian and American caving communities.

Of Mice and Men: Animal Models of Human Brain Disease (panel)

ADVISOR: *Joanne Berger-Sweeney, Biological Sciences and Nancy H. Kolodny, Chemistry*

Synaptic Alterations in a Mouse Model of Rett Syndrome

Liz Storer '04, Neuroscience

Rett Syndrome (RTT) is a developmental disorder that affects about 1 in 10,000 females. RTT is characterized by normal postnatal development until six to 18 months of age, when mental retardation and progressive motor dysfunction become apparent. Most RTT cases are associated with mutations to the X-linked gene encoding MeCP2, a transcriptional repressor. Although it is unclear how this mutation causes RTT, researchers theorize that the mutated MeCP2 protein fails to repress genes controlling synaptic pruning during critical developmental periods. We will test this hypothesis in a mouse model of RTT in which the MeCP2 gene is deleted. We will determine whether MeCP2-deficient mice have decreased synaptic density in the brain by measuring levels of synaptophysin, a presynaptic vesicle protein. We will measure synaptophysin staining density in cerebral cortex in MeCP2-deficient vs. control mice. Eventually, we hope to correlate cortical synaptic density with behavioral performance in the mutant mice.

Rett-like Symptoms in MeCP2 Mutant Mice at Different Developmental Stages

Olive Muizerwa '04, Neuroscience and Rebecca Yang '05, Biological Sciences

Our project aim is two fold. First, we aim to determine how early in postnatal development we are able to detect physical/behavioral characteristics of RTT in a mouse model. Second, we aim to characterize cognitive and anxiety-like behaviors exhibited in these mice as adults. We have used the Fox neonatal battery to assess physical, reflex, and social development of the mutant mice between two and 18 days after birth. We have also examined anxiety and exploratory behaviors using an open field task and an elevated-zero maze on mice ranging in age from five weeks to nine months. Data from these measures have shown delayed reflex development and alterations in social behaviors in the neonatal mutant mice as compared to controls. There are also alterations in anxiety-related behaviors and cognitive behaviors in the adult mice reminiscent of the human condition.

In Vivo MR Imaging and Spectroscopy in MeCP2 Mutant Mice

Brittany Yerby '05, Chemistry and JaeYoung You '05, Chemistry

Magnetic Resonance Imaging (MRI) and Spectroscopy (MRS) provide a noninvasive method to obtain anatomical and chemical information from living tissue. We are developing in vivo MRI techniques to be used at 9.4T to examine structural changes in the brains of MeCP2 mutant mice. MRI data provide information about volumetric changes in specific brain regions. In addition, ¹H MRS techniques are being developed to determine the biochemical changes that occur in the first few weeks of life in the mutant mice. Changes in levels of brain metabolites and neurochemicals in different brain regions determined from these spectra will allow us to track the onset and progress of the disease. The data collected from MRI and MRS techniques will increase our under-

standing of the nature of this neurodevelopmental disorder and may prove to be a noninvasive early detection method.

Does Prenatal Choline Supplementation Improve Memory?

Lauren Brownlee '05, Classics and Africana Studies and Shoshana Maxwell '06

Prenatal choline (a precursor for acetylcholine and a methyl donor) supplementation has been shown previously to improve spatial learning and memory in the offspring rats and mice. These effects are long-lasting, and memory improvements are still apparent when the offspring reach old age (> 18 months). In the current study, we want to examine if improvements in performance extend to another type of learning, namely classical conditioning. Fear conditioning is a test in which the mouse learns to associate a footshock with a tone (cue) and with the place (context) in which the shock is received. Because of specific brain structures involved in different types of learning, we hypothesize that prenatal choline supplementation will improve fear conditioning to a context, but not necessarily to a cue. In the future, we hope to test the efficacy of this prenatal treatment in conditions such as RTT and Alzheimer's Disease.

Names of sponsors:

Marie and John Zimmerman Foundation
National Science Foundation
National Institutes of Health
International Rett Syndrome Association

4:30 – 5:40

Sexual Dimorphism and the Effects of Galantamine on Mouse Locomotion (panel)

Susan Purcell '04, Neuroscience, Helen Kay '04, Women's Studies, Shyla Gowda '04, Economics and Neuroscience, Katherine Lee '04, English and Neuroscience, Grace Park '05, Economics and Neuroscience, Erica Richardson '05, Neuroscience, Rebecca Yang '05, Biological Sciences, Levita Robinson '05, Neuroscience, and Parul Barry '05, Neuroscience

ADVISOR: Mark Goldman, Physics, Joanne Berger-Sweeney, Biological Sciences, and Carol Ann Paul, Biological Sciences

Galantamine (Gal) is a recently approved medication for the treatment of Alzheimer's Disease. This competitive acetylcholinesterase inhibitor amplifies acetylcholine's response by inhibiting the enzyme that breaks down acetylcholine and stimulating brain nicotinic receptors. Often, standard drug doses are prescribed even though males and females can respond differently to the same drug. The Fall 2003 Brain and Behavior laboratory sections examined the effects of Gal on locomotor behavior in both male and female mice. Mice received saline, 0.25 mg/kg, 0.5 mg/kg, or 1.0 mg/kg of Gal. Each mouse was placed on a grid, and crossings, rearings, and circlings were measured. Preliminary results showed that, with increasing doses of Gal, there was a decrease in motor activity in the male population, but an initial increase followed by a decrease in activity in the female population. This research has significant implications as sexual dimorphism has not been a well-studied aspect of disease therapy.

Social Analysis

Wellesley: Getting in, Doing Well (paper session)

Peer Effects of Roommates at Wellesley

Kristen A. Soderberg '04, Economics
ADVISOR: Patrick J. McEwan, Economics

Peer effects are the influence that one person has on another's outcomes. Education economists are interested in studying the peer effects of students on their classmates as a means of explaining a component of student achievement and behavior. Under normal circumstances, however, peer effects studies are plagued by selection bias. We choose with whom we associate, and to some extent which neighborhoods we live in and which schools our children attend. In this sense, Wellesley College presents a unique opportunity to study peer effects. Incoming first years are randomly assigned roommates based on their responses to a housing preference survey form. Thus, the problem of selection bias is removed. The present project combines data collected from the housing preference survey forms of the classes of 2003 through 2006 with information from students' admission files and Wellesley GPA files. By using such measures as SAT score and cumulative GPA, I am able to define the role that peer effects play in the achievement of Wellesley students. (Research supported by the NSF-AIRE summer research program.)

Academic Self-concept and Its Relation to the College Admission Process

Sarah Reeves '04, Psychology and French
ADVISOR: Beth A. Hennessey, Psychology

My research explored the relation between students' academic self-concepts (how they view themselves as learners) and the type of admission plan (early decision or regular) they chose when applying to college. This topic was selected because of an interesting result I uncovered last year. In my research methods class, I found that students who had been accepted to

Wellesley early decision tested significantly lower (less positively) in academic self-concept than did students who had been accepted regular decision. My thesis this year was designed to replicate this finding and to explore this interesting relation further. Towards this end, I gathered data on 50 Wellesley first-years and interviewed high school counselors. In addition, I conducted a secondary analysis of data collected on previous cohorts of Wellesley first-years by the college's Office of Institutional Research. My presentation will outline my findings and probe some of the implications of this research.

Perfectionism and Procrastination in Relation to Maturity

Regina M. Liang '04, Psychology and International Relations
ADVISOR: Julie Norem, Psychology

This study examines the influence of identity style and parental influence on perfectionism, which contributes to academic procrastination. The participants were given seven measures to determine their level of perfectionism, procrastination, identity style, locus of control, and parental influence.

I hypothesize that students with an information-oriented self-identity style and those with a committed self-identity style will take responsibility for their perfectionism and procrastination. In contrast, students with a normative-oriented self-identity style will attribute their perfectionism, and consequently their procrastination, to parental influence.

Further, self-oriented perfectionists will take more responsibility for their study habits than socially prescribed perfectionists. Information-oriented self-identity style and self-oriented perfectionism will correlate positively with internal locus of control, while normative-oriented self-identity style and socially prescribed perfectionism should correlate positively with external locus of control.

4:30 – 5:40

Self and Others (paper session)**Personality, Self-concept, and Sexual Attitudes and Behavior**

Jennifer Clark '04, Psychology and English
 ADVISOR: *Jonathan Cheek, Psychology*

The current study explores the relationship between sociosexual orientation, personality, and self-concept. Simpson and Gangestad (1991) define sociosexuality as the level of an individual's implicit prerequisites to entering a sexual relationship; an individual who is unrestricted in sociosexual orientation does not limit her sexual encounters to those partners with whom she feels psychologically close and requires relatively less time than a restricted individual before engaging in sex. Different areas of psychology offer different theoretical perspectives on the psychological health of women who are "unrestricted" in sociosexual orientation; some are positive and some are remarkably negative. One hundred and seventy Wellesley College juniors and seniors completed a survey including the Sociosexual Orientation Inventory, several other measures of sexual attitudes and behaviors, and questionnaires assessing personality traits and feminist attitudes. Analyses will examine correlations between personality traits and sociosexual orientation.

Influence among Preschoolers and the Effects of Gender Incongruence in Behavior and Social Context

Suah Kim '04, Psychology
 ADVISOR: *Linda Carli, Psychology*

This study tested whether children aged three to five years would be more influenced by male and female puppets when the puppets communicated in a gender-stereotyped manner (i.e., male puppets using a masculine speaking style and female puppets using a feminine speaking style) than when the puppets communicated in a style associated with the other gender. In addition, the study assessed whether male puppets would be more influential when communicating about a masculine subject—the desirability of

trains, baseballs, and other boys' toys—and female puppets would be more influential when communicating about a feminine subject—the desirability of baby dolls, tea sets, and other girls' toys—than when the puppets expressed opinions about toys associated with the other gender. To test this, the children listened to male and female puppets expressing opinions that contradicted the children's own pretested opinions about a variety of different toys. (Research supported by a Schiff Fellowship.)

"That's Way Harsh": The Representation of Social Aggression among Female Adolescents in the Media

Jane Whitney '04, Psychology and Classical Civilization
 ADVISOR: *Sheila Brachfeld-Child, Psychology*

Although important advances have been made in recent years in understanding children, aggression, and the media, much of this work has focused on boys and physical violence. Girls employ physical violence much less frequently than do boys; more often, girls use social aggression to hurt each other in subtle ways by damaging relationships. The influence of the media is particularly strong on adolescents because they consume it so heavily and use cues in their environment in the process of identity development. This study investigates the presence of aggression among characters in contemporary teen movies, with a focus on the ways in which female adolescents use social aggression.

Transforming School Environments: Factors That Lead to Sustainability of Social Competency Programs

Catrin S. Davies '04, Psychology and Women's Studies
 ADVISOR: *James B. Vetter, Open Circle Program, Stone Center*

In recent years, many schools have implemented social-competency programs in the hopes of creating positive classroom environments. However, many programs are quickly discarded after initial enthusi-

asm wanes. In such a climate, how can good programs survive to successfully affect students? This presentation is based on a study that assessed features contributing to the sustained use of *Open Circle*, a social competency program based at the Stone Center. Factors were identified that appear to lead to ongoing use of such curriculum. These findings have implications on larger questions of social change efforts in schools. (Research supported by the Morse Fellowship.)

Globalization and Its Discontents: Original Student Research Projects (panel)

Lisa Concepción '05, Regina Garza '04, Sociology, Helen Kwon '05, Urban Studies, Heather Park '05, Psychology, and Chen Yang '04, International Relations and French
 ADVISOR: *Peggy Levitt, Sociology*

McDonald's, Starbucks, and the Gap are now common features on the street corners of Europe, South America, and Asia. Michael Jackson enjoys unprecedented popularity in the Far East while, in the U.S., we are fascinated by karaoke and Indian films. Does this globalization of production and consumption mean that we are all becoming the same? In this panel, students will present findings from their independent research projects on aspects of globalization.