

9:30 – 10:40

Economic Issues**Global Crises, Global Solutions
(short talks) Pendleton East 239**

Economists from around the world formed the Copenhagen Consensus in 2004 to set priorities in addressing global challenges and compete for a hypothetical \$50 billion to fund policies to address these challenges. In ECON 312 we simulated the Copenhagen Consensus by forming groups to examine the challenges and the proposals to address them. The aim of each group was to persuade our fellow classmates that our global proposal would make the greatest impact on the world's population.

Civil Wars

Diana Choi '08, Economics, Amanda Davis '08, Economics, and Ike Yeung '08, Economics
ADVISOR: *Joseph P. Joyce, Economics*

Civil wars have become more frequent in the past few years, costing countries around the world billions of dollars and plaguing the lives of many innocent people. This presentation presents an economic analysis of the national, regional, and global costs and benefits resulting from regional conflicts. We will examine the effects of civil wars on countries in conflict, its neighbors, and other nations. We will also analyze several opportunities that may help address these challenges as well as discuss two perspective papers that evaluate these opportunities.

Financial Instability

Derice Darlington '08, Economics, Salome Katwiwa '08, Economics, and Lauren M. Rasmussen '08, Spanish and Economics
ADVISOR: *Joseph P. Joyce, Economics*

Financial instability can impose large costs on an economy and financial crises have proven to be more costly for emerging markets and developing countries than any other global shocks. Financial instability leads to a decrease in a country's output and affects its poverty rate and long-term

growth. We will discuss financial instability's social, political, and economic effects and the causes of financial crises. We will also propose solutions for addressing this issue.

Migration: A Global Solution to a Global Crisis

Sara Hess '08, Economics, and Yeatso Lhamo '08, Economics
ADVISOR: *Joseph P. Joyce, Economics*

A general consensus has been reached as to the benefits derived from the free movement of technology and physical capital, but what about human capital? Over 175 million migrants immigrated from low-income to high-income countries in the year 2000. We propose that the overall goal of migration should be to create fewer barriers for the movement of human capital, while simultaneously lowering the economic incentive to migrate. We will examine both the challenges to fulfilling these goals and their potential contributions to the global economy. Finally, we will suggest migration policy initiatives that will maximize upon the expenditure of \$50 billion to make the world a better a place.

Literature and the Arts**The Struggle for Personal Faith in Twentieth-century Literature (panel)
Science Center 104**

Kate Reece '08, English, and Rachel Newman '08, English and Art History
ADVISOR: *William Cain, English*

Religion has the power to dictate every aspect of one's life. This panel will address the multiple facets of religious identity as it is presented in the literary works of Graham Greene, one of England's preeminent Catholic novelists, and Philip Roth, one of the foremost contemporary Jewish American authors. Greene's novels throughout the 1930s and 40s inquire into Catholic doctrine regarding the notions of damnation, mercy, and justice, while also

exploring the complex relation of sinners to their God. In contrast, Roth's work examines the evolution of the Jewish American identity from a purely social standpoint, as well as the trials his protagonists face while attempting to define what being an American Jew in the latter half of the twentieth century entails. Both Greene and Roth grapple with integrating their own religious convictions, or lack thereof, into their works, thus reflecting the tension surrounding religious identity in modern England and America.

Ravel and Berg: Beyond the Genre of Quartet and Violin Concerto (long performance) Jewett Auditorium**Alban Berg (1885-1935): Violin Concerto "To the Memory of an Angel" (1935)**

Katherine Roth '08, Music
ADVISOR: *Gurminder Bhogal, Music*

Alban Berg is a member of the Second Viennese School, a group of composers that included Arnold Schoenberg and Anton Webern. This "school" developed new musical languages of atonality and the twelve-tone method. Although Berg composed few pieces in his lifetime, his Violin Concerto (1935) is the most well known and often performed. The concerto was commissioned by the violinist Louis Krasner (1903-1995) and written in memory of Manon Gropius, the daughter of Alma Mahler. Since the Violin Concerto was Berg's last completed work and has many personal references, including numerology and secret messages, it is also seen as Berg's own requiem. This concerto is the subject of my music performance thesis. I explore Berg's score markings, language, and musical style to show how the seamless incorporation of these musical and symbolic elements contributes to the unique position this concerto holds within the concerto repertoire for the twenty-first century violinist. (Research supported by a Schiff Fellowship.)

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Ravel and Berg: Beyond the Genre of Quartet and Violin Concerto

Ariana Watson '08, *International Relations*, Nicolle Strand '10, *Bioethics Individual Major*, Emily Hung '10, *Psychology*, and Veronika Blinder '10, *Music and Biochemistry*

ADVISOR: Jan Pfeiffer, *Music*

Joseph-Maurice Ravel (1875-1937) was a French classical composer whose works for piano, voice, chamber ensemble, and full orchestra have made him one of the most important French composers in the history of music. His estate supposedly earns more royalties on his music, much of which is still not available to the public, than any other French musician to date. The String Quartet in F Major was completed in 1903 when Ravel was only 28 years old. The composition was dedicated to Ravel's teacher, Gabriel Fauré, and was first performed in Paris in 1904. The piece was submitted to the *Conservatoire de Paris' Prix de Rome* competition and lost in an unexpected upset, after which Ravel left the conservatory. The quartet is written in strict classical form with four movements: *Moderato très doux*, *Assez vif-Tres rythmé*, *Très lent*, and *Vif et agité*.

Political Development

National Identity (short talks) Science Center 278

Understanding American Identity

Allison Dwyer '08, *Political Science*
ADVISOR: Hahrie Han, *Political Science*

In 1776, the Declaration of Independence created the United States as a nation guided by the principles of equality, liberty, unalienable rights, and limited government by consent of the governed. Popular support for the aforementioned values has been relatively consistent throughout the 232 years since Jefferson stated them. The widespread use of public opinion data since the 1980s allows for detailed measurement of fluctuations in core values. By separating political elites

from the general population, we can assess whether the two groups see eye to eye on basic political truths. This insight may help in understanding why, for example, the pervasive polarization among the political class is almost completely absent in the rest of the citizenry.

The Aesthetics of Memory: Holocaust Memorials as Reflections of National Identity in Germany, Israel, and the United States

Raeefa Shams '08, *History*
ADVISOR: Jerold Auerbach, *History*

Germany, Israel, and the United States have all incorporated the memory of World War II and the Holocaust into their respective national identities in very different ways. As a result, the memorials and museums that have been built in these nations, specifically the Holocaust-Mahnmal in Germany, Yad Vashem in Jerusalem, and the United States Holocaust Memorial Museum in Washington, D.C., reflect changing perceptions of the war and these nations' relationships to it. An examination of the architecture and exhibition materials, as well as of the debates surrounding the location, design, and character of the memorials form the core of this project. (Research supported by a Schwartz Fellowship.)

Whoever Comes through the Door: Emergency Departments in the American Health-care System

Alejandra Ellison-Barnes '08, *Anthropology and French*
ADVISOR: Anastasia Karakasidou, *Anthropology*

Hospital emergency departments are intended to treat unexpected, traumatic, and urgent cases. They also provide the "safety net" in the American health-care system, delivering care to all who need it 24-hours-a-day. I undertook an anthropological exploration of emergency departments, examining the culture from the perspective of patients, nurses, social workers, and physicians. The role of

emergency departments in hospitals, the motivations of patients for choosing to seek care at an emergency department, the medical staff who choose to work in that environment, and the changes that have taken place in emergency departments over the past several decades were of interest. In many ways, emergency departments serve as reflections of the social and political issues of society at large.

The Constitution of 1991 and the Opening of Democracy in Colombia

Isabel Lecompte '08, *International Relations and History*
ADVISOR: Alejandra Osorio, *History*

The 1980s will be remembered as one of the bloodiest epochs in Colombia. Political assassinations, car bombs, and a perpetual war created a crisis that threatened to engulf the Colombian State. A move in the 1990s to reach a peace agreement with the rebel M-19 seemed to signal the end of the violence. As part of the peace agreement, a Constituent Assembly was created to dismember the two-party system, which excluded thousands of Colombians. For my project, I researched the trajectory of two new parties: the Oxygen Party, and the M-19 Democratic Alliance. Although both parties were initially successful, the extreme violence directed against its political leaders was sufficient to oust them from the political arena. Although we continue to observe formation of new political forces, the climate of insecurity created by insurgents and the State has impeded the consolidation of the opening of democracy proposed in the constitution of 1991.

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Science and Technology**The Quest to Count More Photons: Studying the Universe with Wellesley's 24-inch Telescope (panel) Pendleton East 339**

Christine Bachman '09, Art History, Billie Briones '08, Astronomy and Anthropology, Sharon Kotz '08, Astrophysics, Kathryn Neugent '10, Astronomy and Computer Science, and Claire Thoma '10, Astronomy and French

ADVISOR: *Stephen Slivan, Astronomy*

Join ASTR 206 for a discussion of the images produced and the research projects carried out at Wellesley's own Whitin Observatory. We will explore the fundamentals of using the CCD camera on the 24-inch telescope to collect photons from distant celestial bodies. We will describe the process of making three-color combined images of deep-sky objects and consider what we can learn about the structure of those objects. We will also discuss how we used our own observations to determine the size of an extrasolar planet, the age and distance of a star cluster, the mass of Neptune, and the period of a variable star.

Building the Links between Adult Neurogenesis and Depression (panel) Pendleton East 139

Elizabeth Marlow '08, Neuroscience, Katherine Zarroli '08, Neuroscience, Youngmi Kim '09, Neuroscience, Colleen Kirkhart '09, Neuroscience, and Rosa Lafer-Sousa '09, Neuroscience

ADVISOR: *Barbara Beltz, Neuroscience*

This panel presentation will discuss student work addressing the major topics in neurogenesis research and their applications to human health. We will present studies on the genesis and growth of new neurons in the adult brain. Beyond the endogenous regulation of neurogenesis, environmental factors have an enormous impact on the growth of new neurons and their functionality. Effects of photoperiod

and temperature on neurogenesis will be reported. Another topic of great interest in neuroscience has been how prescribed medications impact neurogenesis. Given that depression has been linked to low levels of adult neurogenesis, we will report results of research on how lithium, a common mood stabilizer, affects neuronal proliferation. Similarly, the results of a study completed in connection with MGH examining the effects of multiple commonly prescribed antidepressants on neurogenesis in crayfish will be discussed including the implications these findings may have for improving depression treatments. (Research supported by the Arnold and Mabel Beckman Foundation, Brachman Hoffman Fund, National Institutes of Health, and the National Science Foundation.)

Save This Place (short talks) Science Center 396**Saving Endangered Species: International Species Protection**

Lindsey Reed '10, Environmental Studies and Political Science

ADVISOR: *Beth DeSombre, Political Science*

According to the World Conservation Union, 23 percent of mammal species, 33 percent of amphibian species, and 12 percent of bird species are threatened with extinction. Now more than ever, states are confronted with the challenge of determining the best way to legally protect declining species populations. How do states choose among the various international species conservation mechanisms? In what ways do international measures protecting endangered species intersect? What are the implications? (Research supported by Early Sophomore Research Program.)

Parrotfish Grazing on Coral Reefs: An Exploration of Anthropogenic Effects on a Keystone Interaction

Anna Studwell '09, Biological Sciences
ADVISOR: *Glenn Adelson, Biological Sciences*

An estimated one million species of plants and animals inhabit our world's 600,000 square kilometers of coral reefs. However, 10% of these reefs have been destroyed while a predicted 60% are on the verge of collapse due to environmental and anthropogenic effects including overexploitation, coastal development, inland or marine-based pollution, and global climate change. This degradation results in the loss of habitat and the potential extinction of many species that inhabit the reef. The parrotfish is a keystone species that helps to maintain all reefs of the world via the grazing of algae and the breakdown of calcareous sediment. With growing reef degradation comes a heightened decline of parrotfish, thereby resulting in less reef maintenance and thus the potential for continued reef decline and loss of biodiversity.

Low-energy Electron-induced Reactions of CF₂Cl₂: Implications for the Ozone Hole?

Lin Zhu '08, Neuroscience, and Samantha Skinner-Hall '10, Chemistry

ADVISOR: *Chris Arumainayagam, Chemistry*

The interaction between high-energy radiation and matter produces copious amounts of secondary low-energy electrons that, through inelastic collisions with molecules and atoms, produce distinct energetic species that drive a wide variety of radiation-induced reactions. Our research serves to elucidate the pivotal role that these low-energy electron-induced reactions play in high-energy radiation-induced chemical reactions in condensed matter. For example, cosmic rays produce low-energy electrons that, through interactions with CF₂Cl₂, produce Cl atoms that may contribute to the formation of the ozone hole. We conjecture that low-energy electrons also play a pivotal role in biology based on



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a recent claim that the cyclic variation of extra-galactic cosmic ray flux may help explain cycles of biodiversity on earth. Low-energy electron-induced reaction studies such as ours also have important implications for industry, including the cost-efficient destruction of hazardous materials and the electron-induced decomposition of feed gases used in the plasma processing of semiconductor devices. (Research supported by a Beck Fellowship.)

Anxiety and Empathy (short talks) Pendleton West 116

Walking Contradictions: A Psychological Study of the Highly Sensitive Extravert

Michelle Bourgeois '09, Psychology
ADVISOR: *Julie Norem, Psychology*

A study of 64 Wellesley students investigated the relationship between the psychological constructs of extraversion and sensory-processing sensitivity. According to Eysenck's theory of extraversion, extraverts have an innately higher cortical arousal threshold for sensory stimuli than do introverts. However, people with high sensory-processing sensitivity, or "highly sensitive people," are hypothesized to have a much lower cortical arousal threshold and to be easily overwhelmed by sensory stimuli than those with low sensory-processing sensitivity. How then do highly sensitive extraverts satisfy their conflicting needs for social stimulation and an escape from sensory overload? This study hypothesized that highly sensitive extraverts experience more general anxiety and are more aroused by anxiety-inducing situations than extraverts who are not highly sensitive. Discussion will focus on data collected before and after participants engaged in a potentially anxiety-arousing social interaction.

Empathy towards Animals and Humans: A Study Using Video Clips

Becky Salomon '08, Psychology and English
ADVISOR: *Julie Norem, Psychology*

Studies suggest that although empathy towards humans and empathy towards animals are related, they are also distinct constructs. The current study explores differences between the two empathies by varying participants' exposure to three video clips: an emotionally arousing human-oriented clip, an emotionally arousing animal-oriented clip, and a control clip. I hypothesized that participants who viewed a poignant human clip would exhibit higher human empathy than those who viewed a poignant animal clip or the control clip. Those who watched the animal clip were expected to have the highest animal empathy. In this presentation, I will focus on theoretical elaboration and experimental results that help us to understand the two kinds of empathy and their relationship to each other. While the results did not support my hypotheses, I will discuss why this may have occurred, and propose paths for future research.

Personality and Coping with Anxiety

Alexa Fong '08, Psychology and Anthropology
ADVISOR: *Julie Norem, Psychology*

Are there differences in the ways that extraverts and introverts cope with state anxiety? One strategy is the implementation of mindfulness, the awareness of emotions, behavior and experiences in a non-judgmental manner. This awareness is presented through paying attention, on purpose, to the present moment. While it is possible for mindfulness to be a part of innate personality, mindfulness may also be identified as a learned skill. Wellesley College students completed tests to measure mindfulness, extraversion, neuroticism, and anxiety, in addition to participating in a mindfulness exercise (mindful meditation). Results indicated that students who scored higher on extraversion had higher mindfulness scores as

well as lower initial state anxiety scores in comparison to the introvert group. Results suggest that the change in anxiety was a function of extraversion. This study illustrates that the use of mindfulness exercises to reduce anxiety appears optimistic and confirms the interest in clinical programs such as Mindfulness Based Stress Reduction.

Role of Steroid Receptor Coactivator-2 (SRC-2) in Estrogen and Progesterin Action

DaEun (Dana) Im '10, Neuroscience and Women's Studies, and Mackensie Yore '08, Biological Chemistry
ADVISOR: *Marc J. Tetel, Neuroscience*

Estradiol (E) and progesterone (P) act in the brain to profoundly influence a variety of events, including cognition and reproductive behavior. These hormones carry out their physiologic effects by binding to their receptors, the estrogen receptor (ER) and the progesterin receptor (PR), each of which is expressed as two distinct isoforms. Previous research has shown that coactivators, including Steroid Receptor Coactivator-2 (SRC-2), physically interact with ER and PR to facilitate transcription of target genes. In this study, pull-down assays were performed to determine if SRC-2 from rat brain interacts with the isoforms of ER and PR under various ligand conditions. Results show preferential interactions between SRC-2 and certain receptor isoforms, indicating that the receptor isoforms have different functions in brain. These findings will contribute to a deeper understanding of how hormones function in brain to regulate hormone-dependent gene expression and behavior. (Research supported by the Howard Hughes Medical Institute and National Institutes of Health.)

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The Significance of Stable DC-T Cell Interactions in the Differentiation of Effector T Cells

Balimkiz Senman '09, Neuroscience
 ADVISOR: *Marc J. Tetel, Neuroscience*

The immune system operates mainly through T cells and B cells to fight off foreign invaders, called antigens, that gain access to the body. T cells originate in the bone marrow as stem cells and migrate to the thymus, where they differentiate into different types of T cells. They then leave the thymus as naïve T cells and circulate in the blood and secondary lymphoid organs searching for antigen presentation by professional antigen-presenting cells such as dendritic cells (DC). At the onset of this initial T cell-DC interaction there are three phases, each characterized with a specific T cell-DC interaction duration. In this study, we have looked at the significance of phase II, characterized by the stable interaction between T cells and DCs. (Research supported by the Proctor Summer Fund.)

Social Analysis

Women, Rights, and Being Human (short talks) Pendleton West 212

Teaching Marriage: The Moroccan Mudawana

Lynne Adams '09, English and Middle Eastern Studies
 ADVISOR: *Louise Marlow, Religion*

Recent reforms to the Moroccan marriage and family code, or Al-Mudawana, have given rise to new rights for Moroccan women. In an attempt to spread awareness about these new privileges and protections, Moroccan nongovernmental organizations have undertaken a new public-education campaign. This study, performed in the rural, central Moroccan town of Boujaad, examines the workings of these classes and the women who have come to them. In these classes, not only pedagogical ends are being furthered: Moroccan women are coming together in

solidarity to talk, share their experiences, and empower themselves as never before.

Human Rights: Fact and Fantasy

Rachel Behler '10, Sociology
 ADVISOR: *Thomas Cushman, Sociology*

The roles of NGOs and NPOs have become increasingly important in human-rights regulation, yet their ability to promote these standards is directly related to the capitalist market by which they are funded. Human-rights causes must strategically advertise themselves to fit the goals of the funding outlets available. Hence, the causes sponsored in the field are not necessarily indicative of the most serious breaches on the scene. Moreover, even if certain causes have funding potential, backlash and increased persecution of the repressed group must be considered. This presentation will discuss the systematic processes and ethical quandaries that arise in combating human-rights infringements within a global context of limited resources by drawing on modern-day, human-rights campaigns, successful and failed, and on personal field work to illustrate the politics of the human-rights market.

Gender Quotas in Pakistan: The Substantive Representation of Women in Politics

Sahar Bandial '08, Political Science
 ADVISOR: *Christopher Candland, Political Science*

Governments have used gender quotas to bring women into politics, which remains a largely male-dominated enterprise around the world. The belief that gender functions as a criteria for representation drives this initiative. But the question remains: Do women in politics represent other women? While gender quotas might lead to an increased presence of women in politics, these quotas do not necessarily ensure a political culture wherein women can represent other women substantively. In Pakistan, the government has reserved a substantial percentage of seats for women in local, provincial, and national-level representative bodies. But the

institutionalized culture of patriarchy in politics poses an obstacle to women elected through quotas to performing their role as representatives. (Research supported by the Office of the Dean of the College and the Barnette Miller Fund.)

Who Deserves to Eat?: Changing Conceptions of the “Worthy and Unworthy Poor” in Early Modern England

Tiffany Rechsteiner '08, History
 ADVISOR: *Ryan Frace, History*

Sixteenth- and seventeenth-century England witnessed the birth of a government shockingly similar to a modern welfare state, complete with community-owned industries, food and cash handouts and administrators. These innovative developments sought to address a crisis of poverty that jeopardized the commonwealth. However, assistance was only extended to those whose deprivation was unavoidable – the aged, the sick and the widowed – known as the worthy poor. Those judged to be the unworthy poor, the willingly impoverished, faced harsh measures intended to create productive laborers: whippings, brandings, enslavement, forced apprenticeship, mutilation and jailing. The looming catastrophe of the rootless, destitute masses served as the crucible that forged many of our contemporary notions of poverty’s origins and the appropriate role of the state in its citizens’ economic affairs and daily lives. These early modern debates therefore speak to many of our own contemporary dialogues. (Researched supported by the Henry Schwartz Honors Fellowship and Office of the Dean of the College.)

11:00 – 12:10

Cross Cultural Research**Finding Yourself: Exploring Identity at Home and Abroad (short talks, literary reading) Davis Museum****Cultural Identity Development in the Midst of Cultural Conflict: Case Study India and Pakistan***Roheeni Saxena '08, Peace and Justice Studies and Neuroscience*ADVISOR: *Lawrence Rosenwald, English/Peace and Justice Studies*

The ethnic and cultural ties of the individual citizen are highly influential in terms of the vigor of a country's national identity. The case of South Asia, wherein the British decolonized India and Pakistan, is particularly interesting for a study of national identity. When the British left South Asia, the citizens of both these countries were forced to claim a patriotism that could not grow organically from a personal sense of belonging. This reading is from a creative work that explores the implications of the interruption in ethnic identity development described above and its violent consequences.

Being Black and Mormon: Exploring How Boundaries Are Negotiated*Krystal Walker '08, Sociology*ADVISOR: *Peggy Levitt, Sociology*

Mormonism is the third fastest growing religion in the world. From a small sect founded in upstate New York in 1830, it has grown into a huge movement, with close to 13 million members. Yet for over half its history, the Church denied full membership to its Black members. Not until 1978 were African Americans allowed to participate fully in the Church. My study, based on interviews with church members in Massachusetts and New York, examines how the more than 100,000 Black Mormons negotiate their voluntary minority status. I examine how these individuals make sense of their racial and religious identities and how they interact with each other. (Research supported by

an award from the Office of the Dean of the College.)

Economic Issues**Bubble, Bubble, Toil and Trouble: Finance and Real Estate (short talks) Pendleton East 239****Investment Complementarities and the Subprime Crisis: Implications for Policymakers***Aigerim Kabdiyeva '08, Economics*ADVISOR: *Akila Weerapana, Economics*

As recent headlines have made painfully evident, the subprime crisis has taken a considerable toll on financial markets. As a result of mortgage institutions' lax lending practices and other factors, investors appear to have underestimated the risk inherent in mortgage-backed securities (MBS). In a short period of time, risk was repriced across the board and liquidity for mortgage-backed securities dried up as they lost their appeal for investors. Like many other financial crises such as bank runs, currency crises, and debt crises, the subprime meltdown can be analyzed using a global-games framework where the consequences of an individual's actions depends on what others do. In my presentation, I will be looking into how recent advances in models of global games with heterogeneous information and investment complementarities can help us explain investors' behavior during the subprime meltdown. (Research supported by a Schiff Fellowship.)

Transplanting Civil Law into Common-law America: The Effect of New York's 1822 Limited Partnership Act on Economic Activity*Katie O'Banion '08, Economics*ADVISOR: *Eric Hilt, Economics*

American law, originally adapted from English common law, has evolved to meet the unique and changing needs of American society. A topic of recent debate among economists is the importance of a

country's legal origins for its subsequent financial development and economic growth. In 1822, the New York legislature copied French civil law when it introduced a new business form, the limited partnership, into the United States. The limited partnership differed from the general partnership in offering limited liability to one or more "special partners," who supplied capital but did not participate in managing the business venture. In my thesis, I examine how businessmen used the limited-partnership form in New York City in the mid-nineteenth century and the benefits that this civil-law organizational form was able to provide businessmen in a common-law environment. My data comes from archival records. (Research supported by a Schiff Fellowship.)

A Permanent Sprinkle of Gold or a Transient Midas Touch? The Effects of Hosting the Summer Olympics on Housing Markets*SuiLin Yap '08, Economics*ADVISOR: *Karl E. Case, Economics*

Countries spend millions of dollars to bid for the Summer Olympics and billions more to host the Games in hope of economic benefits, urban revitalization, and global prestige. Housing booms occurred in most Summer Olympics' host cities after they won the bid. Post-Olympics house prices continued to soar in some cities but flattened in others. These trends raise concerns about housing affordability, infrastructure's importance for housing markets, and agglomeration effects from global recognition as leading cities. Since the winning host city is announced six to seven years prior to the Summer Olympics, the announcement and the Games can be treated as natural experiments to investigate the economic impact of the Summer Olympics. This thesis studies the effects of hosting the Summer Olympics in Los Angeles (1984), Atlanta (1996) and Sydney (2000) on cities' house prices. I also hope to identify potential implications for Beijing (2008) and London's (2012) housing markets.

11:00 – 12:10

The Impact of Capital Account Liberalization on the Onset of Banking Crises in Emerging Markets

Maggie Settle '08, *Economics*

ADVISOR: Joseph P. Joyce, *Economics*

Banking crises occur when the ability of the banks in a country to lend is impaired because their capital is exhausted by failing loans. Such crises have become increasingly common in emerging markets. In fact, some researchers claim that external financial shocks impose the largest costs to emerging market economies, even more than conflict and wars. Because these crises are extremely costly, preventing them should be a top priority for public-policy makers. The major issue that stalls attempts to prevent banking crises from occurring is the lack of general consensus as to what triggers them. My thesis explores one potential link, the relationship between banking crises and capital controls. I analyze whether or not capital account liberalization, or simply put, the opening up to capital flows over time, has an impact on the onset of a banking crisis in emerging markets.

Gender and Sexuality

Peeping Toms, Puppy Love, Blind Sex (short talks) Science Center 278

Sexual Education for the Blind: The “Birds and the Bees” or “Political Opportunity”?

Catherine Colaneri '10, *English and French*
ADVISOR: Elena Creef, *Women's Studies*

We live in a primarily visual world where so much of what we learn about sex, sexuality, and sexual health is visual. In order to help them become integrated into our visual world, those who interact with the visually impaired must explicitly describe in detail that which they cannot see. Based on research with sex educators and students at the Perkins School for the Blind, this presentation examines how sexual-education curriculum and educators shape the sexuality of the visually impaired. Our

research centered around this question: Does sexual education for the blind reproduce the gender binary and heteronormativity of the sighted world, or does it provide an opportunity to challenge orthodox understanding of sex, gender, and sexuality?

For I See You: Voyeurism and the Reconstitution of the Bodily in Twentieth-century American Poetry

Sumita Chakraborty '08, *English and Creative Writing*

ADVISOR: Dan Chiasson, *English*

In *Song of Myself*, Whitman's speaker watches a woman gaze at bathing men, himself “souse[d] with spray.” Voyeur-poet Dickinson writes, covertly seeing the world from her windows. “Throbbing,” Eliot's blind Tiresias observes a young man's sexual advances in *The Waste Land*. In *The Young Housewife*, Williams' speaker routinely watches an “uncorseted” woman. In *Dream Song 4*, Berryman's Henry, “fainting with interest,” becomes aroused while watching a woman eat. Lowell's speaker covets “love-cars” in *Skunk Hour*, and throughout her work, Plath challenges her readers to watch as her body is sensually transfigured.

Intriguingly, these sites of voyeurism correspond to a reimagining of the bodily. These speakers see what they cannot physically see, experience what they are not physically experiencing, animate the inanimate; consumption is sex, cars are objects of desire, and thumbs become onions. To illustrate this phenomenon, I will discuss sites of voyeurism in Whitman, Dickinson, Eliot, and Williams.

The Role of Socially Interactive Technologies in Adolescent Relationships

Kate Bachman '08, *Psychology*

ADVISOR: Beth A. Hennessey, *Psychology*

Although romantic relationships play a central role in the social and emotional development of American adolescents, these relationships remain understudied in Western culture. Within the last ten years, adolescents have started to employ various

forms of Socially Interactive Technologies (SITs) to enhance communication among their friends and romantic partners. Data were collected on seniors attending a local public high school for the purpose of exploring how adolescents use Facebook, MySpace, cell phones, and IM to participate in romantic relationships. In addition, I examine how these modes of communication affect how adolescents both form and view their romantic relationships.

Literature and the Arts

Studio Art 370 (exhibit) Jewett Student Gallery

Gothic through Graphic Novels: The Images They Present and Inspire

Melissa Woods '08, *Studio Art and Philosophy*

ADVISOR: Phyllis McGibbon, *Art*

What has come under the label “horror” has in recent years been more caricature than genuine. Consider the stiff, green-faced oaf we know as Frankenstein's monster, against the beautiful melancholy (or savagery) of the vaguely subhuman creature in Mary Shelley's original novel. My studio art thesis reconsiders the depth and sincerity of the grotesque image, and the grotesque idea. I began with sets of drawings and prints as my reaction to media-driven horror fiction, some of which are on view today. The subsequent work, chiefly installation, explores the disconnect between the stylization of horror, and horrific images of personal or nonfictional origin. The sublime, as experienced through intellectual terror, reacquaints the modern viewer with the deepest of feelings, be they pain, curiosity, or disgust. Working from a mix of the daily news and the weekend blockbuster, dare we make horror real again?



11:00 – 12:10

A Playful Mythology of Subtly Epic Proportions

Marielle Allschwang '08, Studio Art and Art History

ADVISOR: *Phyllis McGibbon, Art*

Growing to understand that one is ever in a state of becoming, my work considers time and transition through the (sometimes nonsensical) interaction of sound and image. Drawing from turn-of-the-century photographs and glass lantern slides (many of which were found in the Wellesley archives), I developed a series of etchings, monotypes, and charcoal drawings that meditate on the power of the past and the magic of possibility. In the spirit of magical realism, a kind of “fairy tale” or “personal myth” – a world of dreamlike symbols of glaciers, mountains, birds, and sirens – emerges. My project includes an animated short/musical piece to communicate that world of exploration, transformation, and self-discovery. This body of work is, in a sense, a rite of passage.

Cities of the Mind

Alison VanVolkenburgh '08, Studio Art and Art History

ADVISOR: *Phyllis McGibbon, Art*

A city, as the urban historian Lewis Mumford observed, is not merely an assemblage of buildings, but a place “where human experience is transformed into viable signs, symbols, patterns of conduct, systems of order.” I am interested in how we visually experience cities. From skyscrapers to sewers, cities are formed of countless individual components that, encountered separately, are gradually pieced together to form an impression of the whole. Through the process of drawing, I create imaginary cityscapes. I believe that each of us holds at least one city in her mind, and that just as in actual cities, these imagined places are constructed piecemeal from different components – some from personal experience and memory, some from films and books, still others from imagined ideal places – all of which are melded together

in the foundry of the mind. The drawings shown here reveal some of my own personal cities.

Pressing Concerns: Printmaking with a Conscience (exhibit) Jewett Student Gallery

Sultana Abbar '08, Media Arts and Sciences, Katherine Ackerman '08, Studio Art and English, Marie Ayabe '08, Media Arts and Sciences, Amethyst Beaver '08, Art History, Sarah Burney '08, Psychology and Studio Art, Amber Evans '08, Studio Art, Linda Fung '08, Media Arts and Sciences and Psychology, Sarah Gilligan '09, Art History, Lauren Ino '08, Media Arts and Sciences and Art History, Kristin Milosch '09, Media Arts and Sciences, Courtney Richter '09, Studio Art and Art History, and Brittany Sundgren '09, Studio Art

ADVISOR: *Phyllis McGibbon, Art*

In our ARTS 322 Advanced Printmaking class, we have engaged in a collaborative effort to address our growing concern about the changing environment and our impact on the world. The print medium lends itself to the exchange of ideas and the energy of the printmaking studio elicits experimentation and dialogue between artists. We have explored the possibilities of prints, and their ability to multiply and spread information while simultaneously functioning as an art object. This semester has been an adventure into the world of gifting and re-gifting and questioning what we are leaving for future generations. Through our interactive printmaking project, we hope to address the global problems faced by our society. Many of us knowingly contribute to this environmental crisis but rarely admit to it. We hope our work sparks self-reflection and contemplation within everyone who views it as it has within us.

Defining Asian American Identity in Literature (panel) Science Center 104

Jennifer Chun '10, English and Mathematics, Arianne Jong '10, Biochemistry and East Asian Studies, and Christina Kim '09, Biochemistry
ADVISOR: *Yoon Sun Lee, English*

The growing number of Asians within the American population was not reflected in American literature of the past. But now, Asian American literature is an emerging field that reflects the unique experience of living in America as a person of Asian descent. These literary works have been an important means of claiming an Asian American identity and presenting it to the public. In this panel, the presenters will focus on the multiple dimensions of the Asian American experience that have been written by authors such as Joy Kogawa (although Kogawa is Canadian, she will be grouped with the other two for convenience), Maxine Hong Kingston, and Chang-Rae Lee. The presenters will also examine differences in the identities that these writers have asserted over different periods of time, places, and points of view.

Romantic Chamber Music (long performance) Jewett Auditorium

Johannes Brahms (1833-1897): Piano Quartet in C Minor

Veronika Blinder '10, Biochemistry and Music, Nina Hart '09, Political Science and Music, Katherine Roth '08, Music, and Jihyun Yoo '08, Economics and Music
ADVISORS: *Charles Fisk, Music, and Jan Pfeiffer, Chamber Music Society*

The Brahms C Minor Piano Quartet was completed in 1875 after having been started nearly 20 years earlier in the key of C# minor. When Brahms returned to the piece, he changed the key and wrote a new Scherzo and Finale. However, both manuscripts express Brahms' tale of unrequited love for Clara Schumann, the wife of his mentor, Robert Schumann.

11:00 – 12:10

The Piano Quartet was first conceived when Robert Schumann was dying, at which point Brahms decided to carry on Schumann's work in the genre of chamber music. Even though the work was started before Brahms' other piano quartets, which were written in the 1860s, its final version evidenced a new level of compositional maturity, and the piano writing laid the foundation for his renowned Piano Concerto no. 2.

Franz Schubert: Piano Trio no.1 op.99 in B-flat Major

Veronika Blinder '10, Biochemistry and Music, Sang-Hee Min '11, and Katherine Roth '08, Music
 ADVISOR: *Jan Pfeiffer, Chamber Music Society*

Franz Schubert's Piano Trio no.1 op.99 in B-flat Major (1827) is a masterful work for the violin-cello-piano medium. Schubert first wrote for the piano trio in 1812 with a one-movement Piano Trio in B-flat D.28, "Sonata". Fifteen years later he returned to the medium, producing two landmark piano trios. The B-flat Trio was never performed publicly nor published during Schubert's lifetime, although privately performed in Vienna in 1827.

The substantial first movement has an airy piano-strings texture. The soaring patterns in the exposition are varied throughout the movement, ending with an inverted first theme in the coda. The second movement is a lyrical stream of melodic simplicity. This inspired movement's well-balanced structure is enhanced by unanticipated harmony changes. The energetic scherzo has a strong melodic motive in the piano. The finale, listed as Rondo but written in sonata form, is metrically surprising and references popular Viennese music.

Papyrus to Print to Pixel: Tracking the Trajectory of Written Communication throughout History (interactive teaching presentation) Clapp Book Arts

Mary French '09, Psychology, and Josephine Corlett '08, French and English
 ADVISORS: *Ruth R. Rogers, Special Collections, and Katherine McCanless Ruffin, Book Arts Program*

The class of EXT D 240, "Papyrus to Print to Pixel," spent the spring semester learning about the history of written communication, using hands-on experience to gain a unique perspective on the subject. Recreating clay tablets, papyrus sheets and scrolls, early codex book structures, and medieval manuscripts, as well as experimenting with early printing methods, mechanical printing, and on-demand printing, the students of "Papyrus to Print to Pixel" experienced first-hand the evolution of the technology behind the written word. Through lab sessions, group discussion, and experiential learning, the group gained a truly in-depth understanding of the subject matter by applying knowledge of lecture material to relevant projects. Our interactive presentation will share with the Wellesley community our wonderful and truly unique encounters with the history of written communication and we hope that our audience will gain from it as well.

Postcolonial Literature and Film (short talks) Science Center 396

Rewriting History: The Past in Modern and Contemporary Irish Drama

Beth Romano '08, English and Math
 ADVISOR: *Lawrence Rosenwald, English*

Since the end of the nineteenth century, Irish playwrights have been setting their plays during moments of transition in their country's history to explore and establish a cultural identity. Today's playwrights continue this tradition while investigating Ireland's rapidly changing, increasingly global society. In my project I analyze

plays from the Irish Renaissance alongside the reactions of contemporary playwrights to Ireland's recent history. I explore the ways the playwrights choose to represent moments in Irish history, as well as the ways their characters shape their personal history through methods of storytelling. In these plays, establishing a new version of the past is a key step in the creation of a personal or cultural identity. (Research supported by a Pamela Daniels '59 Fellowship.)

The Savage Wars of Peace: Using Literature to Evaluate the Decline and Fall of Empires

Kristina L. Costa '09, Political Philosophy
 ADVISOR: *Debra Candreva, Political Science*

Imperial holdings occupy a unique place in the social and literary consciousness of the colonial metropole, even when the metropole's claim to those colonies begins to falter. In examining the relationship between the French Empire and their "crown jewel" colony – Algeria – and the analogous relationship between the British Empire and India, I hope to address several questions. How does the way in which colonial powers perceive and understand the colonized influence the eventual (and inevitable) nationalist movements within those colonies? What importance may be ascribed to preexisting national identities in these conflicts? In this talk, I will use sources drawn from history, political theory, and literature to explore the relationship between national identity, violence (or nonviolence) in independence movements, and the process of decolonization.

Contemporary Northern Irish Art and Territory: Looking Beyond a Terrible Beauty

Shannon Flaherty '08, Art History
 ADVISOR: *Pat Berman, Art*

The imagery documenting the Northern Irish ethnic conflict termed "The Troubles" has been dominated by an iconography of struggle, pain, and destruction, and by a simple sectarian divide, as shaped

11:00 – 12:10

by the media lens. In contrast to mass-media reportage, contemporary artists from Northern Ireland seek to reveal the diversity of discourses. By critically examining the historical construction of physical territory in the Irish and Northern Irish traditions, artists excavate complex narratives which have been buried by official accounts of the conflict. Works by artists such as Paul Seawright, Victor Sloan, and Willie Doherty describe a world which goes beyond the sensationalism of the media, a two-sided oversimplification of the conflict, and their own inherited sectarian prejudices, and which delves into issues of identity, marginalization of unofficial discourse, and personal and communal experience. My thesis examines their photographic projects.

Political Development

Competing Visions (short talks) Pendleton East 139

Jabotinsky and the Evolution of Separatism in Israel

Meagan Froemming '08, History and Jewish Studies

ADVISOR: *Frances Malino, Jewish Studies*

Inspired by the controversy surrounding Israel's separation wall, my thesis will focus on the origins of Vladimir Jabotinsky's theory of separation and the theory's role in Israel's greater historical legacy. I will explore whether there exists a theoretical link between contemporary separation policies and Jabotinsky's theory or whether these policies are a product only of security needs. I will use the statements and writings of various leaders, as well as the policies they instituted, to assess the theory's influence. Historically, separation has provided an ideological framework for many of Israel's dealings with the Palestinian population; understanding this history is significant as it allows for the clarification of a tumultuous ideological past and new insight into the battle for peace in the state of Israel and the occupied territories.

The Dilemma of Peasant Politics: A Nepali Narrative

Erisha Suwal '08, Economics and South Asian Studies

ADVISOR: *Christopher Candland, Political Science*

Many Nepali peasants supported the decade-long Maoists' Peoples War. Today, both the Peoples War and the autocratic rule of the King have ended. Maoists are being rehabilitated; Nepal moves towards Constituent Assembly elections. But were the peasants ever revolutionary? A revolutionary peasant, according to the Communist Party of Nepal (Maoists), will have both the political consciousness and the organizational ability to seize state power. However, many Nepali peasants were up in arms, not to seize state power, but to secure their land rights. Further, revolutionary politics in Nepal today includes nonparty agents as well as political parties. Peasants were mobilized by the dynamic involvement of NGOs advocating for land rights on behalf of the peasants. With the help of these NGOs, Nepali peasants organized themselves into a nation-wide network demanding their rights and land reform. As peasants gain political consciousness they do so to claim their rights, not necessarily to overthrow the state. (Research supported by a Schiff Fellowship.)

Paris as Ideological Battleground: The Third Republic, the Commune, and Competing Visions of Modernity

Mattie Fitch '08, History and French

ADVISOR: *Ryan Frace, History*

During the Paris Commune of 1871, the last in a series of radical uprisings that defined the nineteenth century in France, Paris became both a literal and figurative battleground of competing visions of modernity. The bloody conflict between the Third Republic's moderate republicans and the insurgent Commune's radical republicans would decide more than the command of the city; the outcome would determine France's future as a republican nation. To the Commune's "socialist demo-

crats," the city represented the forefront of worldwide social regeneration and their Paris reflected this identity both physically and socially. When the Third Republic ultimately triumphed, the moderates undertook the conversion of France to republicanism and the sanitization of Paris's revolutionary past. In my presentation, based on my senior thesis, I will explore the ideological struggle for Paris as well as relationships between political ideology, urban space, and national identity. (Research supported by a Jerome A. Schiff Fellowship and the Henry Schwartz Honors Fellowship.)

Science and Technology

Football Scores and Open Lockers: An Interactive Hands-on Exhibit in Mathematics (interactive teaching presentation) Pendleton West Knuckle

Erika Kahn '09, Political Science, Jennifer Kim '09, Mathematics and Economics, Elisa Lee '10, Economics, Samantha Lowe '10, Mathematics, Dingjie Ma '09, Mathematics and Philosophy, Laura Murphy '10, Psychology and Mathematics, Xing-Yin Ni '09, Economics, Angela Shau '10, Mathematics and Economics, Jane Wu '11, and Zoe Xiao '10, Mathematics and Economics

ADVISOR: *Ann Trenk, Mathematics*

MATH 223 students will show you some exciting hands-on math puzzles and models in number theory. Which numbers can be written as the sum of two perfect squares? What amounts of juice can you measure with glasses of size 9 oz. and 12 oz.? What football scores are possible if points can only be scored by field goals (3 points) or 7-point touchdowns? Which lockers will be open after a parade of middle school students go by – the first one opening every locker, the second one closing every other locker, the third one switching the state of every third locker, etc.?

Come to our exhibit, play with the models



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and learn how to solve these and other fun problems. This exhibit is designed for the general public – no background in mathematics is needed or expected!

Dealing with Stress: Lessons from Cyanobacteria (panel) Science Center 277

Cyanobacteria are photosynthetic bacteria of ecological and evolutionary importance, as they cause toxic blooms in polluted waters and maintain the earth's oxygen atmosphere. Since they have evolved over 3.5 billion years, these microorganisms have adapted to multiple sources of stress. This panel will discuss what we can learn from cyanobacterial stress responses.

The Acid-stress Response of Cyanobacterium *Synechocystis* sp. Strain PCC 6803

Megan Friedman '08, Biological Sciences, Elizabeth Jeruto '09, Biological Sciences, and Nancy Lee '10, Neuroscience and East Asian Studies

ADVISOR: *Mary Allen, Biological Sciences*

The goal of this research is to study the acid-stress response of *Synechocystis* sp. strain PCC 6803. To study the acid-stress response, stationary-phase proteins, produced as a response to acid-stress conditions at pH 6.2, were harvested through lyophilization and BPER extraction. One- and two-dimensional electrophoresis techniques were employed to accomplish proteomic analysis of the proteins extracted. 1-D electrophoresis separates proteins by molecular weight while 2-D separates by molecular weight and charge. The differences in proteins expressed between acid-stressed and non-acid-stressed cells observed from these studies, as well as those of previous students, have revealed the variation of gene expression at the protein level found under acid-stress conditions. Further isolation, comparison, and identification of stationary-phase acid-stressed proteins are underway. (Research supported by the Howard Hughes Medical Institute, the Brachman Hoffman Fund and Wellesley College.)

Increased Activity and Synthesis of Amino-Acid Decarboxylases as an Acid-Stress Response of Cyanobacterium *Synechocystis* sp. strains PCC 6308 and 6803

Monica Fung '08, Biological Chemistry and Music, and Sabina Sayeed '09, Biological Sciences

ADVISOR: *Mary Allen, Biological Sciences*

Cyanobacteria are alkalophilic and raise the pH of their environment when placed in acidic media via several postulated means, including amino-acid decarboxylation. Amino-acid decarboxylases are enzymes that catalyze the reaction in which a carboxyl group is removed from amino acids. Secretion of the resulting basic amine raises the pH of the environment. Previous results showed increased decarboxylase activity in acid-stressed cyanobacteria. Western Blot analysis of decarboxylase synthesis is being used to determine whether synthesis of amino-acid decarboxylases is part of the acid-stress response of cyanobacteria. Current data have shown increased decarboxylase synthesis in cyanobacteria acid-stressed for three different time periods, suggesting that amino-acid decarboxylation is involved in the acid-stress response of cyanobacteria. (Research supported by the Howard Hughes Medical Institute.)

The Acid-stress Response in Cyanobacteria: Raising the External pH

Caroline Sheridan '08, Biological Sciences

ADVISOR: *Mary Allen, Biological Sciences*

When acid-stressed at a pH of 4.0 or above, cultures of *Synechocystis* sp. strain PCC 6803 are observed to raise the pH of their medium. The increase in pH appears to be density dependent when cells are stressed below a pH 6 – denser cultures demonstrate a greater increase in pH than less dense ones. Cells grown in non-acid-stress conditions also demonstrate an increase in external pH over time, but the increase is not density dependent. It is hypothesized that acid-stressed cyanobacteria excrete something into their environment, raising the pH. Ammonia

was selected as a possible candidate for excretion since ammonium is readily available in the cell, thanks to its role in nitrogen assimilation. Ammonium development over time in acid-stressed cultures was found, but never in a culture that survived the acid stress. It is possible that ammonium measured in these cultures came from lysed cells and not active excretion. (Research supported by the Howard Hughes Medical Institute.)

Investigating the Role of Sodium/Proton Antiporters in Acid-stressed Cyanobacteria Using ³¹P NMR Spectroscopy

Jessica Tse '09, Biological Chemistry, and Yih-Chieh Chen '10, Chemistry and French

ADVISOR: *Mary Allen, Biological Sciences, and Nancy H. Kolodny, Chemistry*

At least five antiporter genes involved in active transport have been identified for *Synechocystis* sp. PCC 6803, a strain of cyanobacteria often used in scientific research. Studies suggest that sodium/proton antiporters play a role in regulating internal and external pH in acid-stressed cells. To study this hypothesis, the internal pH of cells grown under ideal and acid-stressed conditions was determined through analysis of Pi chemical shifts using ³¹P Nuclear Magnetic Resonance (NMR) spectroscopy. Living cells were studied in 20mm NMR tubes, where light and 5% CO₂ in air were provided, mirroring normal growth conditions; confocal microscopy showed cell viability. Future studies will focus on generating high-resolution spectra as well as using ²³Na NMR spectroscopy to ascertain the role of the sodium/proton antiporters in a cell's ability to maintain its internal pH. (Research supported by the Merck/AAAS Undergraduate Science Research Program and the Howard Hughes Medical Institute.)



11:00 – 12:10

Do Cells Move toward and away from Light?

Charlene Chong '08, Biological Sciences and Spanish, and Amber Cabrera '10, Japanese Language and Literature
 ADVISOR: *Mary Allen, Biological Sciences*

The cyanobacterium *Synechocystis* sp. strain PCC 6803 has developed methods of optimizing growth in its environment. As photosynthesizers dependent upon light, *Synechocystis* 6803 cells have been shown to move relative to a light source.

Cyanobacterial type IV pili appendages have been shown to drive bacterial movement toward or away from light as positive or negative phototaxis functions in motility and surface adherence. Cells were plated on mineral medium agar and were exposed to a unidirectional white light source to determine if phototaxis could be induced in *Synechocystis* 6803. The presence of type IV pili in *Synechocystis* 6803 cells exhibiting phototaxis was investigated using transmission electron microscopy (TEM) and growth in plates. (Research supported by the Howard Hughes Medical Institute and the AT&T (BellSouth) Mentoring in the Sciences Gift.)

Dormancy as a Bacterial Strategy: Challenging the Cyanobacterium, *Synechocystis* sp. with Ampicillin to Investigate and Characterize a Possible Dormant State

Kaitlyn Lucey '08, Biological Sciences
 ADVISOR: *Mary Allen, Biological Sciences*

Stressed bacterial populations face a critical choice between either proliferating and risking death, or suppressing growth to protect themselves until conditions are conducive to development. Bacterial persister cells and viable but nonculturable (VBNC) cells display the latter phenomenon. Cell dormancy, however, has not been investigated in cyanobacteria, and the objective of my research is to describe a potential dormant state in the cyanobacterium, *Synechocystis* sp. strain PCC 6308 challenged with ampicillin. Data indicate that ampicillin at concentrations of 160µg/mL and 800µg/mL is effective at lysing

Synechocystis cells at log and stationary phases, respectively. Moreover, penicillinase at similar concentrations can induce cell recovery of cultures. These data will be used to determine the ability of cyanobacteria to grow and divide after being stressed with antibiotics before they are placed in new media. (Supported by the Howard Hughes Medical Institute.)

Memory and the Corners of My Mind (short talks) Pendleton West 116**Memory 101 – A Game for ARTH 101**

Kelley Tialiou '10, History of Art and Architecture
 ADVISOR: *Panagiotis T. Metaxas, Computer Science*

This interactive multimedia application allows Art History 101 students to prepare for the final exam, while playing a version of the game “memory” adapted to the educational purposes of this project. The necessity of memorizing a noteworthy volume of information in order to succeed in this exam seems to be a perfect match both with the nature of this game, and the computer’s ability to perform random shuffles, check right and wrong answers, and time each round. More specifically, the users of this game will have to match each one of the key works of the course with the correct summary info given in one of the other windows. Repetition of this process can lead to memorizing the necessary information for each work, such as artist, date, era, place, genre, and medium. Finally, the solution will display the entire selection of images, paired up with their respective info cards.

The Costs and Benefits of Implicit Memory

Brandi Newell '08, Psychology
 ADVISOR: *Margaret Keane, Psychology*

Sometimes vivid, sometimes elusive, sometimes misleading – for better or for worse, our memories make up part of who we are. Some events can be recalled deliberately, whereas others may influence our behavior without conscious recollection.

These two types of memorial effects are examples of explicit and implicit memory, respectively. My thesis research focuses on a specific type of implicit memory called priming. Priming is the result of prior experience with task stimuli, and can affect task performance even when the rememberer cannot consciously recall having previously encountered the stimuli. My project seeks to determine if priming is beneficial or costly (or both) to our implicit memory processing. (Research supported by funds from the Class of 1966 Associate Professorship.)

Thinking with Our Hands: The Role of Gesture in Word Retrieval

Maša Đikanović '10, Cognitive and Linguistic Sciences
 ADVISOR: *Jennie E. Pyers, Psychology*

Research has suggested that gesture may play a role in word retrieval. However, the findings are mixed – some studies show that gestures offer an alternative path to the lexicon (Butterworth & Hadar, 1989; Rauscher et al, 1996), while others find no relationship between gesture and lexical access (Goldin-Meadow, 2003). Yet all suffer from methodological issues that limit their interpretation. In this study, we examined the relationship between gesture and lexical retrieval by looking at tip-of-the-tongue states (ToT). We conducted a picture-naming task, during which participants were asked to name pictures likely to induce a ToT state. We allowed one group of participants to gesture, and we inhibited the gestures of another group. Using Gollan & Accenas’ (2006) stringent ToT coding scheme to isolate only those ToTs that are true retrieval failures, we anticipate that participants in the gesture-inhibited condition will not have more ToTs.

11:00 – 12:10

Spatial Language and Cognition in Deaf Signers in Nicaragua and the United States

Annemarie Kocab '10, Cognitive and Linguistic Sciences

ADVISOR: *Jennie E. Pyers, Psychology*

Learners of an emerging sign language in Nicaragua present a rare opportunity to study the relationship between spatial language and cognition. In this unique linguistic community, the children have rapidly added the linguistic means to encode spatial relationships, while the adults have yet to acquire such language. This creates an inverted community where adults have more experience with how objects are spatially related than children do, but have less understanding of spatial language.

This study examined whether mental rotation skills of the Deaf Nicaraguan signers correlated with their mastery of spatial language. We examined older signers, younger signers, and a comparison group of 11 American Sign Language (ASL) signers. We found that younger Nicaraguan signers outperformed the older ones, and their performance correlated with their spatial language. Further, their mental rotation skills did not significantly differ from ASL signers. Thus, language seems to play an important role in spatial cognition. (Research supported by the Office of the Dean of the College.)

Thanks for the Membranes (short talks) Pendleton West 117

Topology of Bacterial Cyclic Nucleotide-gated Ion Channels

Samantha Littlejohn '09, Chemistry and Classical Civilization, and Adrienne Topic '09, Biological Chemistry

ADVISOR: *Donald E. Elmore, Chemistry*

Our work focuses on a new class of bacterial cyclic nucleotide-gated (bcNG) ion channels that will provide insight into ligand gating in higher organisms. Eukaryotic ion channels analogous to bcNG ion channels play an important role in such physiological processes as sight,

smell, and cardiac function. Past computer modeling studies predicted the structure of bcNG ion channels. We are looking to verify this predicted topology using biochemical techniques. By converting specific amino acids to cysteine, we induced mutations in our channel. We then used a reagent that would only react with cysteine residues outside of the cell membrane. Any reagent attached to cysteine was visualized by Western blot using a luminescent detection reagent. We successfully made these mutations in *E. coli*, an easily manipulated species. Mapping the topology of the membrane protein will aid in future studies focusing on the channel. (Research supported by the Amabel Boyce James Fund for Research in the Sciences and the Patricia Davis Beck '43 Endowed Fund for Chemistry Research.)

Buforin II Interactions with Lipid Membranes

Eleanor Fleming '08, Biological Chemistry, and Natalya P. Maharaj '09, Biological Chemistry

ADVISOR: *Donald E. Elmore, Chemistry*

Buforin II (BF2) is a twenty-one amino acid polycationic antimicrobial peptide that is believed to translocate into cells and bind to nucleic acids without causing membrane permeabilization. The sole proline residue of BF2 has been shown to form a disruption in the peptide's α -helical structure and to be important to translocation. We have investigated a series of BF2 variants that alter the position of its proline by one residue or one helical turn. To elucidate the mechanism by which wild type BF2 and these variants interact with and enter cells, the interactions of buforin II with lipid vesicles of varying compositions were examined. Fluorescence spectroscopy and circular dichroism measurements were utilized to determine the membrane affinity and secondary structure of buforin II. We have also measured the translocation ability of the BF2 variants into lipid vesicles using an ELISA-based assay with biotin-labeled peptides. (Research supported by Research

Corporation, the Janina A. Longtine Fund for Summer Research, and the Roberta Day Staley and Karl A. Staley Fund for Cancer-related Research.)

La Vie in Silico: Molecular Dynamic Simulations of Bacterial Ion Channels

Li Xiong '08, Biological Chemistry

ADVISOR: *Donald E. Elmore, Chemistry*

Bacterial cyclic nucleotide-gated (bcNG) ion channels are a recently identified family of channels gated by cyclic nucleotide ligands and potentially by voltage and mechanical stress. Models of the bcNG channel from *Synechocystis* sp. have been refined in this study through molecular dynamics (MD) simulations that analyzed stability of the channel and its domains along with response to gating stimulus. The stability of different structures of the controversial C-terminal domain of the mechanosensitive channel of large conductance (MscL) in *M. tuberculosis* at physiological pH was also investigated using MD simulations. Altogether, these simulations offer insight on structure-function relationships in bacterial ion channels and their domains.

Proteomics of the Chloroplast Outer Envelope Membrane of *Arabidopsis thaliana*

Dorhyun Johng '08, Biological Chemistry

ADVISOR: *Gary Harris, Biological Sciences*

Chloroplasts, organelles found in plant and algal cells, are the sites of various biosynthetic functions such as photosynthesis, synthesis of plastid membrane components, and lipid-derived signaling molecules. Chloroplasts originated from the uptake of free-living cyanobacteria by host cells through endosymbiosis. For endosymbiosis to be successful, the invader, cyanobacteria, had to integrate itself into the host cell's cytosolic protein network. This integration presumably involved multiple protein-protein interactions between the host cell and the cyanobacteria. Our goal was to identify some of the proteins involved in such interactions. To accomplish this, we

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incubated isolated chloroplasts with concentrated and biotinylated crude protein extracts from *Arabidopsis thaliana* leaves and analyzed which proteins were associated with the chloroplast's outer surface membrane or envelope. Our results have revealed that a large number of proteins appear to bind to the outer envelope, suggesting that the chloroplast acts as a hub in the cellular network.

Social Analysis

How Do Our Children Grow? (short talks) Pendleton West 212

The Hybrid Classroom: Blending Traditional and Nontraditional Classroom Discourse Patterns to Facilitate Student Engagement in the Learning Process

Lauren Brown '09, Spanish
ADVISOR: *Verónica Darer, Spanish*

Traditional classrooms are usually teacher-centered and based on Initiation-Response-Feedback (I-R-F) discourse patterns. Nontraditional classrooms tend to be more student-centered and consist of a variety of discourse patterns. However, some classrooms fall somewhere in between traditional and nontraditional models of classroom discourse. This study examines and analyzes the subtle discourse patterns of a suburban public high school social studies lesson. I will share how the blend of traditional and nontraditional classroom discourse fostered an environment in which reciprocal teacher-student interactions encouraged students' critical thinking and personal responsibility in the learning/teaching process.

The Struggle for Teachers' Rights: The Origins of Teacher Unionism in New York City

Megan Carey '08, American Studies
ADVISOR: *Barbara Beatty, Education*

New York City's teachers gained the right to bargain collectively in 1960 after decades of struggle. Like their counterparts in many other cities, teacher unionists in New York faced resistance from the public and from fellow educators. To many, the traditional perception of teaching as a selfless, feminine occupation was difficult to reconcile with the supposedly selfish act of unionizing. Teachers who were comfortable with unionizing often divided themselves along gender, ethnic, and educational lines and competed with each other for power and benefits. Using archival materials and secondary sources, this presentation will trace the uniting of a diverse teaching force into a single organization and illustrate how conflicted Americans are about paying teachers good salaries, a problem that discourages many from going into the profession.

The Influence of Maternal Depression on Preschoolers

Amanda Johnston '08, Psychology
ADVISOR: *Wendy Wagner Robeson, Wellesley Centers for Women*

The preschool years are a critical time in which the interaction between social and gender development strongly impacts how young children view others and how they behave. Gender-based rules of behavior are often transmitted from parents to their children. What behaviors develop when preschoolers are raised by a depressive mother? Studies have demonstrated that children influenced by maternal depression will display more maladaptive behaviors than children without depressed mothers. However, while many studies have focused on infants and older children, few have focused on the links between maternal depression and preschoolers' behavior problems. My research investigated the relationship between maternal depression and the development of problem behavior

in preschool-aged children, with a focus on gender differences. (Research supported by the Anne Murray-Ladd internship.)

The Supreme Court and Public Opinion: From *Minersville v. Gobitis* to *West Virginia Board of Education v. Barnette*

Laura Beckerman '08, History
ADVISOR: *Nathaniel Sheidley, History*

In 1943, the Supreme Court of the United States ruled that the free speech clause of the First Amendment and the due process clause of the Fourteenth Amendment to the U.S. Constitution protect students from being compelled to salute the flag and recite the Pledge of Allegiance. *West Virginia Board of Education v. Barnette* (1943) precipitously reversed the Court's previous position condoning the compulsory flag salute, articulated just three years earlier in *Minersville School District v. Gobitis* (1940). The seemingly unexpected change of heart surprised contemporary observers. I examine public debate about the flag salute and its influence on debate within the Court in order to better understand not only the Court's reversal in these two cases but also the Justices' broader effort to redefine the relationship between the Court and American society during the 1940s. I show how and why this process cost the Court its unity. (Research supported by the Henry Schwarz Honors Fellowship.)

1:30 – 2:40

Gender and Sexuality

Gender and Sexuality (panel) Pendleton West 212

Clothing Identity: Race, Gender, and the Search for Authenticity

Chloe Woodward-Magrane '08, Women's Studies

ADVISOR: *Irene Mata, Women's Studies, and Rosanna Hertz, Women's Studies*

How do young people today negotiate the search for “authentic” selves in a world still bounded by racial and gender divides? I interviewed college students about their bodily representations of authenticity through clothing, hip-hop music, and politics, focusing on the Democratic primary race between Barack Obama and Hillary Clinton. While young people still recognize and feel constricted by determining the rules of “authentic” self, some have found a new “puzzle mentality” for questioning borders of gender, race, and sexuality by redirecting and tearing apart cultural products to fashion a new and hybrid self. Ultimately, I ask whether or not, based on experiences of hybrid identities formed through clothing and hip-hop, Obama's youth-powered and transracial bid for president signals a new political future outside the bounds of the “authentic” raced and gendered body.

That Space between Butch and Femme: Performances of Lesbian Sexuality in Seattle

Ariel Knight '08, Women's Studies

ADVISOR: *Irene Mata, Women's Studies, and Rosanna Hertz, Women's Studies*

Consider for a moment the ways in which you interact with your environment. Most people can agree that they tend to present and conduct themselves according to the location or situation in which they find themselves. I am curious about the ways in which this general idea applies to the ever-growing LGBT community in my hometown of Seattle. More specifically, I have studied the many ways it differs

between lesbian-identified women who grew up in the Seattle area and those who grew up in presumably more conservative regions of the United States. Using the background notions of social constructionist and queer theories, sexual migration, and regulation of space, I will discuss the variety of ways in which “native” and “non-native” lesbian-identified women present themselves in both LGBT and heterosexual spaces, the parameters of which include the boundaries of Seattle's neighborhoods and Washington State's above-average inclusion of the LGBT population in its protective laws.

Controlling Sexuality: The Campaign against Pornography

Elizabeth Diflo '08, Neuroscience and Women's Studies

ADVISOR: *Irene Mata, Women's Studies, and Rosanna Hertz, Women's Studies*

In modern American society, pornography has been defined and regulated in ways that help sustain a particular power structure and sex hierarchy. As Gayle Rubin has outlined, the only “right” sexuality is considered to be heterosexual, missionary, marital, procreative, and loving, and any deviation from that is “bad sex”. The anti-pornography feminist movement demands the right to gender equality through the elimination of pornography, and the end to violence against women through practice of “proper” sexuality. Similarly, the state wants to create sexual order by way of laws and statutes against certain types of sexual activity as well as “obscenity”. Both crusades strive for the same thing, the regulation of obscenity/pornography, while exerting the power of sexuality to control society, and in so doing, perpetuate the sex hierarchy, and demonize anyone who deviates.

Grrrls, Bois, and Everyone Else: Perceptions of Identity and the Medical Establishment in Trans Zines

Diane Stutzky '08, Women's Studies

ADVISOR: *Irene Mata, Women's Studies, and Rosanna Hertz, Women's Studies*

While some trans people protest against medical and psychological definitions of transsexuality as a disorder, most rely on the medical establishment for basic health care, hormones, or surgery. Trans individuals who write zines, or self-published pamphlets, make up a radical subculture within the transgender community, further complicating their relationship with medicine. Trans zinesters often consider gender to be fluid, expressing a freedom to play with gender and a desire to subvert the gender binary. Many write about resistance to centralized authority, including medical authorities, yet others encourage their readers to seek medical care. Examining zines drawn from four major archives, I explore both the criticisms and medical needs of trans zinesters, showing how the current medical system both alienates and assists this community of self-identified radical trans persons. (Research supported by a Schiff Fellowship.)

Literature and the Arts

Trans-form-action (exhibit) Jewett Student Gallery

Magdalena Naydekova '08, Architecture

ADVISOR: *Carlos Dorrien, Art*

Trans-form-action is an independent sculpture project I undertook in the fall of 2007. The piece was designed to occupy a site next to the Jewett Arts Center, on the pathway between the Wang and the main academic quad. The form of this work explores spatial transformation as a process, rather than a series of changes to be observed in a passive manner. It is not simply a sculpture that tells a visual story, it asks a viewer to pause and to interact with its form directly. Individual visitors are encouraged to enter the piece in

1:30 – 2:40

order to understand the impact of its scale and proportion in relationship to the human body.

Experiencing Space through Color and Light (exhibit) Jewett Student Gallery

Rebecca Amponsah '08, Architecture
ADVISOR: *Phyllis McGibbon, Art*

Artist Paul Klee once equated light and form to a visual sensation: “light and the rational forms are locked in combat; light sets them into motion, bends what is straight, makes parallels oval, inscribes circles in the intervals, makes intervals active”. I am interested in spatial relationships and the way that color works in various drawing and collage media. My independent study project explores the spatial potential of color by way of translucency, opacity, rhythm, reflection, light, and shadow in a three-dimensional environment. The glass walkway between the Jewett Arts Center and Pendleton West provides me with a site that has natural light shifting throughout the day, further, transforming the space. I invite you to take a journey through space, place, and time and experience the magic.

Bawds, Bards, and Babes (long performance) Alumnae Hall, Ruth Nagel Jones Theatre

Ruth Craig '09, Theatre Studies,
Sophia Giordano '09, English, Valerie King '09, Theatre Studies and Anthropology, Michelle Guadalupe '08, Theatre Studies, and Mary Plant-Thomas '10, Theatre Studies
ADVISOR: *Nora Hussey, Theatre Studies*

Now a Ruhlman tradition, Wellesley College Theatre students will present scenes, stories, and songs from the 2007-2008 season. Student directors and actors collaborate with each other to recreate theatrical highlights of the season. Working with music, dance, and narrative they innovatively transform the Ruth Nagel Jones Theatre. From Southern Georgia to Southern Illinois, ancient Greece to

Hamlet's Denmark and many places between, these snippets of life will inspire laughter, tears, and excitement.

Musical Creativity and Expression in Works for Solo Flute (long performance) Pendleton West 220

Leah Driska '08, Music and American Studies, Meagan Richard '10, Sue He '10, Jessica Lin '10, and Adriane Otopalik '11
ADVISOR: *Suzanne Stumpf, Music*

While compositions for flute and keyboard instruments are most prevalent in the flutist's repertoire, solo works for the instrument offer their own unique opportunities for examining the flute's great potential for musical creativity and expression. In contrast to the multiple voices and harmony created by a flute together with other instruments, a flute alone can only provide a single melodic line. Both challenging and, in some ways, liberating, these solo works demand a particular clarity of musical direction and experimentation with tone color. Through the performance of pieces from the baroque through the twentieth century, we will explore the sound worlds that can be created by solo flute.

“Telling” Stories (short talks, literary reading) Science Center 396

Path of a Story: Development in a Newsroom and Back to an Audience

Mehroz Baig '08, Spanish
ADVISOR: *Joy Renjilian-Burgy, Spanish*

As an intern for Boston's WHDH Special Projects Unit, I became familiar with many stories that went through researchers, producers, and editors and were finally packaged for on-air broadcasting for a general audience. This presentation aims to look at the process of putting together a broadcast for a local news station and how an in-depth investigation functions within that larger sphere. News is meant to inform a large audience yet it has to work with time and resource restrictions. I hope to explore how producers navigate those restrictions, why stories become impor-

tant, and the ultimate trajectory that creates our headlines.

“Breaking Kosher:” A Short Story

Paige Boncher '08, English and Spanish
ADVISOR: *Alicia Erian, English*

Flannery O'Connor once said that anyone who survived their childhood has enough material to write for the rest of his or her life. My creative writing thesis is a collection of short stories that draws on memories from my childhood, my travels in Latin America, and my own imagination. In the story I plan to read, Rachel Fain is a Jewish-American college student studying abroad in Buenos Aires who, at the goading of her host-mother, falls head-over-heels for the Argentine woman's iconoclastic son. A practicing Jew who thinks she knows her “type”, Rachel struggles to understand why the boy's elusive and hedonistic nature appeals to her more than anything she has known at home.

Beyond *Rashomon*: Akutagawa Ryunosuke and the Dilemma of Representation

Clarice Jhia Huei Gan '08, Japanese and English
ADVISOR: *Carolyn Morley, East Asian Languages and Literatures*

Praised by Jorge Luis Borges for combining “extravagance and horror” with a “crystal clear” prose style, Akutagawa Ryunosuke (1892-1927) is one of modern Japan's most masterful and widely read storytellers. While renowned for his highly allusive and frequently baroque style, Akutagawa has also been the subject of scholarly attention for his self-confessed preoccupation with “prose fiction without a story-like story”, a mode of writing that Akutagawa himself considered highly mimetic. I contend that the tension between these two modes of writing – one artificial and the other mimetic – is one that plays itself out in his stories. This project will examine a selection of critical writings and short stories spanning Akutagawa's career as I attempt to reconcile these two disparate literary impetuses in his work.

1:30 – 2:40

“Books Are Where Things Are Explained to You”: Julian Barnes and the Postmodern Problem of Truth

Abigail Dalton '08, *English and History*
ADVISOR: Lisa Rodensky, *English*

Julian Barnes is a name that neither academics nor recreational readers are very familiar with. An author whose work ranges from essays, to short stories, to novels, Barnes is unique in that he explores postmodern concepts in his writing, while simultaneously disclaiming any attachment to theory. My thesis attends to four of his novels: *Flaubert's Parrot*, *A History of the World in 10 ½ Chapters*, *Talking it Over*, and *Love, Etc.* Although the books are distinct in subject matter and style, each takes up the connections between truth and fiction, representing the complexity of these connections both thematically and formally. By examining Barnes's influences, contemporaries, and works, I offer a study into an intensely self-contradicting author whose work nonetheless contains consistent themes and ideas, and which is ultimately essential to the study of contemporary literature. (Research supported by a Schiff Fellowship.)

Bodies/Work: An Exhibit (exhibit) Jewett Student Gallery

Jean Campbell '09, *Studio Art*, Erica Harmon '08, *Medieval/Renaissance and German Studies*, Amber Evans '08, *Studio Art*, Emily Peters '09, *Cinema and Media Studies*, Francesca Gobeille '09, *Media Arts and Sciences*, Cristina Fernandes '10, and Rachel Kerr '09, *English*
ADVISOR: Judith Black, *Art*

As a body of students working with various photographic techniques from the cumbersome 4X5 view camera to the digital SLRs, from traditional wet darkroom processes to color inkjet output, we are each honing a series of photographs that address a variety of subjects. Some of us work with image and text, some with artist books, some with fictional approaches, some with a documentary focus. All are bodies of work that reflect

various ways with which each of us engages with the world and responds to it through the medium of photography.

Original Creative Work

Wellesley Coffee House (literary readings, short performance) Lulu Chow Wang Campus Center Pub

Fatty Acid Drips, German Monks, and Visits to County Jail: A Collection of Nonfiction Essays

Ariel Levine '08, *English and Women's Studies*
ADVISOR: Marilyn Sides, *English*

My father bought his very own Tesla Coil. The electrical machine generates high voltages of cold energy, a purple lightning storm effect. It's a great party trick and whenever I want to impress the dynamic and mystical quality of my household upon a guest I ask my father to demonstrate how the invention works. Each essay in my collection attempts to make this same impression, featuring a different member of my family and many of our eccentric guests. The collection, as a whole, crackles with all the spark and quirkiness of my New Age, Jewish family as we navigate the “soul-scape” of Marin County, California, with only enema bags, Buffered Vitamin C, and crystal-loving spiritualists to guide us.

Identity and Violence: A Memoir

Francisca Guzmán '08, *Political Science*
ADVISORS: Stacie Goddard, *Political Science*, and Alicia Erian, *English*

Psychologists provide a number of therapies, treatments, and medications to help their patients cope with traumatic situations. Abuse, in particular, requires more than drugs, since the dignity lost cannot be replaced by the few hours of happiness medications can provide. After years of abuse, which affected every aspect of my life from friendships, school, work and family, I looked at an alternative healing method: writing. The endeavor of writing

a memoir was a means to understand the writing process (editing, frustration, and writer's block) better, and the form by which to reevaluate my emotions. How can anger be used in a positive way? How do you transform violence into art? But most importantly: how do you redefine yourself? (Project supported by Pamela Daniels '59 Fellowship.)

Strings + Jazz + Energy = Synergy!

SuiLin Yap '08, *Economics and Mathematics*, Rakeen Mabud '09, *Political Science and Economics*, Chindhuri Selvadurai '10, Christine Chen '10, Erika Boeing '10 (Olin), Meghann Williams '11, Layla Gardner '11, and Dan Grieneisen '11 (Olin)
ADVISOR: Paula Zeitlin, *Music*
ACCOMPANIST: Vanessa Morris

Although string instruments are traditionally associated with classical and fiddle music, string players are also part of the world of improvisational jazz. Synergy is an on-campus string ensemble that delves into this genre that is not often explored by string players. Structured as a classical string ensemble with violins, violas, cellos, and bass, Synergy will celebrate the fusion of jazz and strings in a performance of Latin, rock, jazz, and blues favorites.

Science and Technology

No Test Tubes Required: Advances in the Fight against HIV, One Bit at a Time (panel) Pendleton East 239

Andrea Johnston '09, *Chemistry*, Mona Minkara '09, *Chemistry and Middle Eastern Studies*, Ilene Tsui '09, *Neuroscience*, and Bilin Zhuang '09, *Physics and Chemistry*
ADVISOR: Mala Radhakrishnan, *Chemistry*

Computational chemistry is an incredibly powerful tool to attack the challenge to treat and cure HIV from different angles. Biological data, methods of computer science, and physical principles can all be incorporated in a variety of ways in order to analyze clinical data, design drug cock-

1:30 – 2:40

tails, and consider structure in optimal drug binding. Students from the Radhakrishnan lab will present on their progress this semester using the tools of computational chemistry to move forward in the battle against HIV.

Of Mice and Monkeys: Brain Function (short talks) Pendleton West 116

Focal Colors in Humans and Macaque Monkeys

Cleo Stoughton '11

ADVISOR: *Bevil R. Conway, Neuroscience*

Imaging studies of macaque monkey have found regions in posterior inferior temporal cortex called “globs”, several millimeters wide, that respond more strongly to color than black-and-white. Using single-unit recording, we determined that most glob cells had color tuning. For the 325 glob cells tested, the strongest color preference was red, followed by yellow, green, and blue. These four colors constitute the complete set of focal colors. (Focal colors can describe almost all other colors, e.g. orange is reddish-yellow.) This is the first demonstration of an explicit representation of focal colors in the brain; moreover, the relative proportion of neurons tuned to each of the focal colors matches the stereotyped sequence, shown by Berlin and Kay (1969), in which color names are adopted in language. These findings suggest that focal colors are a fundamental feature of the trichromatic primate brain and may underlie the universal evolution of color-naming.

The Disneyland Effect: Recovery following Environmental Enrichment in a Mouse Model of Rett Syndrome

Jennifer Moriuchi '09, Neuroscience

ADVISOR: *Joanne Berger-Sweeney, Biological Sciences/Associate Dean of the College*

One of the most devastating aspects of the developmental disorder Rett Syndrome is that affected girls develop typically for 6 to 18 months before entering a period of regression and losing acquired skills and

language. Because of this regressive nature, the need for treatments effective after symptoms have manifested is pressing. We have found that exposure to an environment enriched with cognitive and sensory stimulation alleviates some of the motor and cognitive deficits associated with Rett in a mouse model of the disorder. Because we did not introduce the enrichment until relatively far into development, our results provide promising evidence for the effectiveness of late interventions in the disorder. Further research will examine neurochemical changes associated with the behavioral improvement following environmental enrichment. (Research supported by a Wellesley College Faculty Grant.)

Investigating the Schizophrenic Model with Pre-pulse Inhibition

Loren Saulsberry '10, Neuroscience

ADVISOR: *Joanne Berger-Sweeney, Biological Sciences/Associate Dean of the College*

Schizophrenia, a debilitating mental disorder, is characterized by positive symptoms (e.g. hallucinations), negative symptoms (e.g. flattened affect), and cognitive disorders (e.g. subtle memory deficits). Currently drug treatments for schizophrenia treat primarily the positive symptoms leaving the more subtle negative and cognitive symptoms largely untreated. We hypothesize that the negative and cognitive symptoms are related to malfunctions in the glutamatergic neurochemical system. We are working with mice with a genetic mutation in one enzyme in the glutamatergic system to model the symptoms associated with schizophrenia. Here we show that the mutant mice react virtually identically to controls in pre-pulse inhibition (PPI), a behavioral test to determine whether the mice can learn to dampen a response to high-decibel sounds. Other previous studies have used pre-pulse inhibition to model schizophrenic symptoms. These data do not support our original hypothesis but may indicate that symptoms resulting from the mutation may be too subtle to detect with PPI. (Research

supported by BellSouth Corporation's Nonemployee Board of Directors' Charitable Contribution Program, now a part of AT&T.)

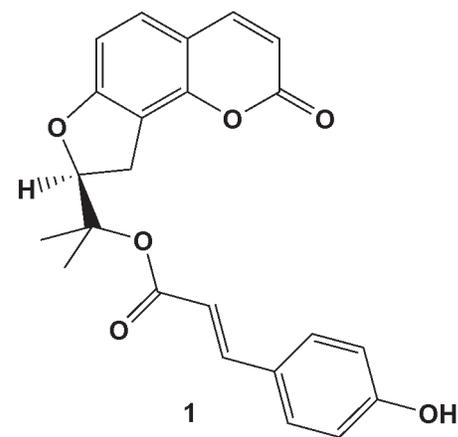
Cancer: At the Frontlines (short talks) Pendleton West 117

Progress toward the Enantioselective Total Synthesis of Angelmarin: A Natural Product Targeting Pancreatic Cancer

Christina Woo '08, Chemistry

ADVISOR: *Dora Carrico-Moniz, Chemistry*

Pancreatic cancer has the highest mortality rate of all human cancers, and a small molecule therapeutic offers significant potential as a treatment modality. Angelmarin (1) is a novel coumarin-based natural product that was isolated from extracts of the medicinal plant *Angelica pubescens* and found to exhibit toxicity specifically against the pancreatic cancer cell line PANC-1. Progress toward the enantioselective total synthesis of the natural product along with synthetic optimization studies will be presented. The natural product will serve as a scaffold for future investigation of structure activity-relationships in an effort to develop a superior therapeutic agent.





1:30 – 2:40

Uncovering a Novel Role for the Growth-Regulatory Protein TOR in the Yeast Cell-Division Cycle

Lieu T. Tran '09, Neuroscience
ADVISOR: Jennifer Hood-Degrenier,
Biological Sciences

Rapamycin is a drug with immunosuppressive and potential anticancer properties that inhibits growth of eukaryotic cells by disrupting the activity of the protein TOR. TOR plays a fundamental role in controlling a variety of processes related to cell growth, most notably ribosome biogenesis. Although growth and division are distinct cellular processes, links between the TOR pathway and the cell-division cycle are likely to exist. Research shows that cells lacking Clb5, an important cell-cycle regulator called a cyclin, are hypersensitive to rapamycin, suggesting that TOR and Clb5 may have overlapping functions.

Rapamycin treatment has been shown to cause microtubule depolymerization and nuclear-positioning defects in wild type cells. Using fluorescence microscopy, this research aims to determine if these defects explain the rapamycin hypersensitivity of Clb5 and, more broadly, to uncover a novel connection between TOR and the cell cycle. (Research was supported by NSF RUI.)

Cancer Immunotherapy: Development and Characterization of a Monoclonal Antibody Reactive against Pancreatic Cancer

Ashmita Banerjee '08, Biological Chemistry
ADVISOR: Andrew C. Webb, Biological Sciences

Monoclonal antibodies (mAbs) offer low-toxicity and high-specificity alternatives or adjuncts to conventional cancer treatment. Immunotherapy using mAbs is a promising approach to treating pancreatic cancer, which has poor prognosis and is typically unresponsive to chemotherapy or not amenable to surgery. The mAb CHO31.1 binds to a membrane glycoprotein A33 (GPA33) over-expressed by gastrointestinal tract tumors and kills pancreatic tumor cells both *in vitro* and *in*

vivo. Part of our ongoing development of CHO31.1 as a potential immunotherapeutic is the molecular characterization of the CHO31.1 binding site (epitope) on A33 and its genetic effects on the tumor cell. The epitope recognized by CHO31.1 is determined by assessing fluorescent mAb binding to GPA33 expressed on noncancerous mammalian cells transformed with genetically engineered A33. Removal of regions within the extracellular domain of A33 should localize the CHO31.1 epitope (Research supported by Staley and Schiff Fellowships.)

**Brain and Behavior (poster session)
Science Center Focus****Investigating the Expression of Cholinergic Cells in the Striatum Region of the MeCP2-Mutant Mice**

Natalie Chen '08, Neuroscience
ADVISOR: Joanne Berger-Sweeney, Biological Sciences/Associate Dean of the College

Rett syndrome is a developmental disorder that predominantly affects girls, and its phenotypes include gait ataxia, stereotyped-hand movements, emotional disturbance, and mental retardation. We speculate that alterations of the cholinergic system in the striatum regions of the brain result in an imbalance of excitatory vs. inhibitory inputs in the basal ganglia motor circuit. This imbalance leads to many of the aforementioned motor deficits, particularly stereotyped movements. In this project, I will investigate the number of cholinergic interneurons, which provide primarily inhibitory inputs, in the striatum region using MeCP2-null mice as a model for Rett syndrome.

Estrogen, Enzymes, and the Female-Reproductive System

Lindsay Kua '08, Neuroscience
ADVISOR: Adele Wolfson, Chemistry/
Associate Dean of the College

Hormones use systems of checks and balances on each other. During the female-reproductive cycle, gonadotropin-releasing hormone (GnRH) secretion from the hypothalamus stimulates the release of estrogens (primarily estradiol) and progesterone, which feed back into this system to alter GnRH levels by unknown mechanisms. We hypothesized that these hormones modulate the expression of the natural GnRH-degrading enzyme, thimet oligopeptidase (TOP), thus regulating GnRH levels. Using immunodetection methods, we examined how ovariectomy and subsequent estradiol and/or progesterone treatment changed TOP expression in female rat and mouse brains. TOP levels in both species were highest in the hypothalamus compared to other brain regions. Estradiol-treated animals showed lower TOP expression in the hypothalamus compared to controls, indicating that estradiol may downregulate TOP expression to maintain high levels of GnRH at certain points in the reproductive cycle. Additionally, we explored the possible role of estradiol in activating TOP by phosphorylation.

Cells in Reproductively Relevant Mouse Brain Regions Express Ovarian Steroid Receptors and Nuclear Receptor Coactivators

Courtney Ackeifi '10
ADVISOR: Marc J. Tetel, Neuroscience

Estradiol and progesterone act in the rodent brain to elicit changes in behaviors and physiology. Estradiol induces progesterone receptor (PR) expression in brain regions involved in female reproduction. Nuclear-receptor coactivators enhance the ligand-dependent transcriptional activity of steroid receptors, including estrogen receptors (ER) and PR. Work by our lab and others has shown that two nuclear-receptor coactivators, steroid-



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receptor coactivator-1 (SRC-1) and SRC-2, are important in ER-mediated induction of PR in brain and in steroid-dependent behaviors. In order for nuclear-receptor coactivators to function in hormone-dependent transcription and behavior, the receptor and coactivator must be expressed in the same cell. Using a triple-label immunofluorescence technique, we will determine if individual PR containing cells in brain express SRC-1 and SRC-2. These experiments will further our understanding of basic mechanisms of how hormones act in the brain, and their possible role in brain disorders such as depression and Alzheimer's disease. (Research supported by the AT&T (BellSouth) Mentoring in the Sciences Gift.)

Enzymes and How They Work (poster session) Science Center Focus

The Effect of Various Divalent Cations on the Folding of LNR

Lauren Choi '10, Biological Chemistry
ADVISOR: *Didem Vardar Ulu, Chemistry*

Notch receptors are multidomain transmembrane proteins that are important for cell-cell communication and development. The Lin-12/Notch Repeat (LNR) is a small disulfide-rich sequence of 35 residues first identified within the Notch receptor. Deregulated Notch signaling has been linked to many human diseases such as sclerosis, artereopathy, and leukemia. Functionality of this protein depends on the proper folding of the molecule. It has been shown that Ca^{2+} is required for LNR folding. This study will test the effect of other divalent cations during LNR folding using the first LNR from human Notch1 and compare it to that of Ca^{2+} . The results of this study will help to elucidate the mechanism of metal binding and importance of metal type specificity during the protein-folding process. (Research supported by a Wellesley Faculty Award.)

Putting the TOP Puzzle Together One Substrate at a Time

Stefany Acosta-Torres '10, Neuroscience, Sadaf Saeed '08, Philosophy, and Maria Fatima Bisquera '10, Biological Chemistry
ADVISOR: *Adele Wolfson, Chemistry/Associate Dean of the College*

Thimet oligopeptidase (TOP) is a metallo-enzyme highly expressed in the brain, testis, and pituitary glands of mammals, and is involved in the metabolism of small peptides active in the central nervous system. Previous work suggests that TOP can metabolize an unusually wide range of substrates due to the flexibility of a loop opposite the binding pocket. Therefore, we are exploring the relationship between structure and function of the enzyme by comparing the activity of wild type and mutated forms of TOP with different size substrates to determine which mutations affect its binding capacity. Specifically, we are investigating the 599-611 loop region of TOP which has been chosen because of its high glycine content, known to give an enzyme flexibility. By substituting glycine with much bigger amino acids like alanine or proline, we can pinpoint which residues are specifically involved in TOP's unusual flexibility. (Research supported by the AT&T (BellSouth) Mentoring in the Sciences Gift.)

Metal-ion Selectivity and Affinity of the LIN-12/Notch-Repeat

Christina Hao '09, Biological Chemistry
ADVISOR: *Didem Vardar Ulu, Chemistry*

Notch receptors are transmembrane glycoproteins that regulate cell fate in multicellular organisms via a highly conserved signaling pathway. Three tandem LIN-12/Notch-Repeats (LNRs) are responsible for maintaining the receptor in its resting conformation prior to ligand binding. These highly conserved LNR modules contain three characteristic disulfide bonds and a group of conserved aspartate/asparagine residues that coordinate a Ca^{2+} ion, which is essential for its correct folding. In this work, we used human Notch1 LNRA (hN1LNRA) as a model system to investigate the binding specificity and

affinity of calcium, zinc, and terbium to an LNR using isothermal titration calorimetry (ITC). We also compared the binding affinities of these metals for the wild type hN1LNRA to a mutant form of hN1LNRA, where the serine in position 19 is replaced by an aspartate. This work represents important steps in elucidating the basis for metal-ion selectivity by the LNRs.

Breathing Lessons (poster session) Science Center Focus

Synthesis and Characterization of Antitubercular Pyrazoles

Emile Bordelon '10, Biological Chemistry
ADVISOR: *Michael Hearn, Chemistry*

Globally, tuberculosis continues to be the chief single cause of death due to an infectious agent. According to the World Health Organization, one third of the world's population is infected with tuberculosis, and as many as three million deaths per year have been attributed to such infection. With increasing numbers of tuberculosis strains showing high virulence or high resistance to the standard antituberculosis drugs, there is a continuing need for new chemotherapeutics to meet these challenges. Using the methods of synthetic organic chemistry, we have begun an investigation of the antitubercular properties of pyrazoles, a class of heterocyclic compounds that may show potential against virulent or resistant strains of tuberculosis.

Investigation of the Morphology of Alveolar Type II Pneumocytes in a Mouse Model of Rett Syndrome

Hyon S. Kim '08, Neuroscience
ADVISOR: *Joanne Berger-Sweeney, Biological Sciences/Associate Dean of the College, and Vachik Hacopian, Biological Sciences*

Rett Syndrome (RTT) is a neurodevelopmental disorder that is diagnosed almost exclusively in girls and that is caused by a mutation in the methyl-CpG binding protein 2 (MeCP2) gene on the X chromosome. The phenotype of RTT includes hypotonia, apraxia, microcephaly, mental retardation and autistic-like behaviors.

1:30 – 2:40

Respiratory abnormalities, typically exhibited as alternating episodes of hyperventilation and apnea, are also one of the most striking characteristics of RTT and considered to be the primary cause of sudden death. While the neurological contributions to the phenotype have been studied, very little is known about what is occurring at the cellular level in the lung. This study used light and electron microscopy to characterize the morphology of alveolar type II pneumocytes in the peripheral lung of a MeCP2-knockout mouse model. A MeCP2 deficiency is thought to cause morphological changes in these cells, which may contribute to the respiratory abnormalities.

Altered-gene Expression in the Hearts of Goldfish Acclimated to Low Oxygen

Sarah D. Park '08, Neuroscience, Thutrang T. Nguyen '08, Biological Sciences, and Esther Kang '09, Neuroscience
 ADVISOR: *John S. Cameron, Biological Sciences*

Compared to other vertebrates, goldfish (*Carassius auratus*) are unique in their capacity to survive for several days without environmental oxygen. Previous data suggest that the hypoxia-induced activation of cardiac ATP-sensitive potassium (KATP) channels may serve to increase tolerance of low oxygen, and we have characterized a nitric oxide (NO)- and cGMP-dependent signaling pathway by which this occurs. The purpose of the present study was to resolve the altered expression of genes associated with this pathway in response to hypoxia acclimation. Goldfish were exposed to moderately hypoxic conditions (2.6 mg O₂/l) for one week. Using quantitative RT-PCR, the expression of KCNJ11, a gene coding for a subunit of the KATP channel, NOS2a, (NO synthase) and HIF1a (hypoxia-inducible factor) were characterized in the hearts of acclimated vs. nonacclimated animals. Preliminary data support the hypothesis that the response to chronic hypoxia in this species involves an upregulation of KATP channels during acclimation. (Supported by the Brachman Hoffman

Fund and the Howard Hughes Medical Institute.)

New England Surroundings (poster session) Science Center Focus

Characterizing Forest Communities

Relena Ribbons '09, Environmental Studies
 ADVISOR: *Marcy Thomas, Biological Sciences, and Glenn Adelson, Biological Sciences*

The main objectives for this project were to characterize forest communities in the Wellesley College area and to investigate the impacts and relationships humans had with these landscapes. Standard methods in forest ecology such as measurements of dbh were used to assess forest composition and structure. A large portion of this project involved unearthing the human history and determining the footprint on the landscape. Connections were made between the anthropogenic impacts of the past and their reflections upon the current composition of the forests.

Re-evaluating the Roxbury Conglomerate

Mei Ai Khoo '08, Geosciences
 ADVISOR: *Margaret Thompson, Geosciences*

Conglomerates in the Boston Basin have classically been grouped together as the Roxbury Conglomerate, but recent geochronological work and other observations have cast doubt on the validity of this assumption. Focusing on an area in Milton, Massachusetts that is south of the main Boston Basin, this research seeks to compare conglomerate in the Mattapan Anticline with more typical Roxbury Conglomerate farther north in the basin. Detailed lithologic comparison will be combined with U-Pb dating of associated volcanic rocks to test the accuracy of grouping all conglomerates as the same formation.

Social Analysis

Language and Society: Variation and Its Meaning (panel) Science Center 104

Yuri Choi '11, Shoshana Effron '09, Psychology, Shan Jiang '10, and Meghann Williams '11
 ADVISOR: *Andrea Levitt, French and Cognitive and Linguistic Sciences*

People are often fascinated by the differences in others' speech. The field of linguistics that focuses on differences in language use and their social meanings is called sociolinguistics. We all recognize when speakers use a dialect that is unlike our own, and we know that others and we change our ways of speaking depending on things like the subject, the context, or the addressee. In LING 238, Sociolinguistics, every student conducts a data collection project on language variation and its meaning, focusing on sources of variation such as accent, gender, and style. This panel will feature students from the class who will present the data from their class projects.

Behind the Shoji (the rice curtain): Contemporary Japanese Social Issues (panel) Pendleton East 339

Marie Ayabe '08, Media Arts and Sciences, Angela Choi '08, American Studies and East Asian Studies, and Diana Kim '08, Art History
 ADVISOR: *Yoshimi Maeno, East Asian Languages and Literature*

Japan is a country shrouded in mystique that is often associated with ideals of propriety, harmony, and peace. However, behind this cultural veil lie realistic problems that need to be presented to our current generation. Three students from JPN 309: Readings in Contemporary Japanese Social Science will investigate unique issues regarding gender and education in Japanese society today. Topics include Japan's growing bullying problem (*Ijime*); the Japanese womanhood – living



1:30 – 2:40

as a wife, a mother, and a career woman; and Japan's gender politics and birth control issues. At the root of these problems are Japan's traditional values that still govern the Japanese mind.

**Between Scylla & Charybdis:
Analyzing Women's Rights from
Cultural Universalist and
Relativist Perspectives (panel)
Pendleton East 139**

Vanessa Arslanian '09, Political Science and Biological Sciences, Lisa Snider '11, Amanda Wyatt '11, Shannon Smith '11, Carla Legros '10, Sociology, Maria Bybee '10, and Cindy Kung '08, Sociology and Psychology

ADVISOR: *Thomas Cushman, Sociology*

Many Westerners believe women's physical, sexual, and marital freedoms should be of paramount priority for human-rights work. However, what cosmopolitan, Western elites consider rights violations must be considered in relation to the functionality and purpose of particular practices toward women within cultures. This presentation explores tensions between cultural universalists, those believing in fundamental rights that transcend culture, and cultural relativists, those believing all rights are "true" only within culture. Cases reviewed include bride kidnapping in Kyrgyzstan, honor killings in the Middle East, and virginity examinations in Turkey. Looked at in comparative sociological perspective, these cases reveal ethical and moral challenges to Western judgments and interventions.

**Language and Cognitive Development
in Children with Autism (panel)
Science Center 278**

Margaret Echelbarger '08, Cognitive and Linguistic Sciences, Kathryn Germer '08, English, and Veronica Cole '09, Cognitive and Linguistic Sciences

ADVISOR: *Ruth Tincoff, Psychology*

Autism is a developmental-neurobiological disorder that involves characteristic difficulties with language and social communication. Researchers and clinicians are currently investigating how autism is diagnosed, the spectrum of signs and symptoms, and the particular difficulties children with autism face in communicating and understanding language. Research we conducted independently and at MIT in the Wexler ab/Normal Language Laboratory focuses on how children with autism comprehend grammatical structures that are used in social communication. This specific problem provides a starting point for understanding the complexities of autism. We will give an overview of this vibrant field of research, discuss the questions we are investigating, and explain the conclusions we can draw regarding language and cognitive development.

**Self-perception (poster session)
Science Center Focus**

**Spaghetti and Rugby: Perceptions of
Students Based on Dietary Choices**

Jessica Weng '09, Biological Chemistry and Psychology, Berenice Rodriguez '08, Psychology and Italian Studies, and Alyssa Moten '08, Psychology

ADVISOR: *R. Steven Schiavo, Psychology*

A person's preferred food choices can influence others' opinion of that individual, especially in regard to masculinity and femininity. Students from Wellesley College were randomly selected to a feminine or masculine meal-type condition and to an athlete or community service condition. They read a fictional journal entry of a student and completed a questionnaire about her. We were interested in determin-

ing whether more positive qualities were associated with those who ate a feminine diet and whether the perception of the female based on her diet differed depending on if she were an athlete. Results show that meal type is a very salient factor in forming perceptions of others. The student that ate the masculine meal type was perceived to be less healthy but perceived to have more positive personality qualities. The type of activity that they participated in did not have a major effect for perceptions of the student.

**The Effects of Grooming and
Smiling on Perceptions of Female
College Students (poster session)
Science Center Focus**

Jane Bendfeldt '08, Psychology, Lauren Cross '08, Psychology, and Katie Robart '08, Psychology

ADVISOR: *R. Steven Schiavo, Psychology*

In a 2 X 2 design, 48 undergraduate women were randomly assigned to view a photograph of a female college student who was either smiling or not smiling. The target's clothing, makeup, jewelry, and hairstyle were also altered to make her either well or poorly groomed. It was hypothesized that the student would be seen more positively in aspects of personality, sociability, intelligence, and leadership characteristics when she was well groomed or smiling than when she was poorly groomed or not smiling. It was found that smiling had a stronger effect than grooming, particularly for measures of sociability. In terms of leadership characteristics though, smiling and grooming together had significant effects: the poorly groomed, nonsmiling student was seen as having less positive characteristics as a leader than the student in all other conditions.

3:00 – 4:10

Cross Cultural Research**Other Modes of Translation:
Problems in Logic, Text, and Time
(panel) Pendleton East 339**

*Catherine H.S. Lee '08, Philosophy,
Jen Feldman '08, Comparative Literature
and Russian Area Studies, and
Emily M. Bogue '08, Cognitive and
Linguistic Sciences*
ADVISOR: *Lawrence Rosenwald, English*

Abandoning commonplace and limiting definitions, this panel discussion will explore translation's impact on our understanding of the world. Translating natural language into the language of classical logic forces a categorization of everything as either 'true' or 'false', failing to account for vagueness, paradox, and other indeterminacies. Alternate logics have emerged to counteract these shortcomings, but their ability to match the expressive power of natural language has not been fully realized. Are subjectivity and ambiguity somehow inherent? To include one's own biography, lexicon, and knowledge is something that is done, often covertly, in every literary creation. We will explore two methods of amplifying and magnifying these issues so that we may inspect them more closely, beginning with intentionally poetic translations of Japanese films. Finally, our exploration of the unintentional will uncover what is lost – and, sometimes more surprisingly, what is retained – over multiple translational “generations” of a single text.

Economic Issues**Eat Well, Live Well, and Be Well
(short talks) Science Center 278****Healthy Revolutions: The Effects of
Revolution in Chile's and Cuba's Health
Care Systems**

Laura Diss '08, Peace and Justice Studies
ADVISOR: *Alejandra Osorio, History*

The history of twentieth-century Latin America was marked by revolution. Revolutions dramatically altered all aspects of national society including health-care systems and social services. Two such movements, the Cuban Revolution of 1959, and the military coup led by General Pinochet in Chile in 1973, provide the context for my analysis of the significant changes in health care that came about in these nations as a result of these two very different revolutions. A historically informed analysis of the socialized medical system put in place in Fidel Castro's Cuba and the contrasting neo-liberal, market-based system implemented by the Pinochet regime in Chile allows for a unique discussion of health care, human rights, and revolution in Latin America. My analysis also suggests valuable lessons for our own quest for an optimal health-care solution in our nation.

**Post-Hurricane Mitch Nicaragua: The
Impact of Early Childhood Malnutrition
on Education**

Grace Logan '08, Economics
ADVISOR: *Patrick McEwan, Economics*

Nicaragua is a country with a long history of poverty and inequality. In October 1998, Hurricane Mitch made landfall, bringing with it flooding and winds that killed thousands, destroyed vast amounts of infrastructure, and left hundreds of thousands with limited access to food, water, and shelter. The resulting shock to nutrition in children in the early stages of development will have a long-term impact on their physical and cognitive development and also negatively affect school

enrollment, and educational attainment. I will look at how early childhood malnutrition played a role in delayed school enrollment for those children impacted by Hurricane Mitch. The measured impacts can shed light on how important early childhood nutrition can be for advancing education in developing countries.

**The Double-edged Sword of
Humanitarian Aid: Exploring the
Mixed Effects of Aid to Communities
in the Philippines**

*Ilang Guiroy '09, Neuroscience and
Art History*
ADVISOR: *John Rhodes, Art*

Through working with the community-health branch of Silliman University Extension Program in Dumaguete, Philippines, I realized that while humanitarian aid is vital to developing countries, it can also result in inadvertent negative effects. Aid accomplishes much good, but its particular execution often fails to take advantage of available resources. This has resulted in inefficiencies that deprecate recipients' self-image and engender new ambitions that in the grand scheme tend to undo much of the good aid has made possible: watered-down condensed milk instead of breastfeeding for infants, ill-adapted concrete rather than well-adapted bamboo houses, hospital-centered rather than preventative health care. The purpose of this presentation is to explore the reasons why aid does not seem to work at its maximum potential, to examine the negative consequences, and to offer some suggestions for improving aid's effectiveness. (Research supported by Wei Fong Chu Chao Endowed Fund, CWS Summer Stipend Program.)

3:00 – 4:10

Eating Away from Home: Child Fostering and Well-being in the Côte d'Ivoire

Tammy McGavock '08, *Economics*

ADVISOR: Ann Velenchik, *Economics*

Fostering children – the voluntary practice of sending children to live for a time with relatives or friends – is a widespread social institution in sub-Saharan Africa. Nearly 20% of all children in West Africa spend up to three years of their childhood living away from both parents. Whether or not fostering is beneficial for fostered children (or for that matter, beneficial for their biological siblings who remain at home, or for the biological children of host households) is a question only recently explored by development economists. My thesis presentation will discuss the impact of fostering on the educational and nutritional attainment of all children involved, through an econometric analysis of data from household surveys conducted by the World Bank in the Côte d'Ivoire (Ivory Coast) from 1985 through 1988.

Gender and Sexuality

Gender, Social Networks, and Marginalization (panel) Pendleton West 212

Learning How to Friend People: Communication and Subjectivities in Facebook

Gabrielle Abousleman '08, *Women's Studies and Anthropology*

ADVISOR: Irene Mata, *Women's Studies*, and Rosanna Hertz, *Women's Studies*

As more people begin using social networking sites, such as Facebook, both our methods of communication and the way in which we understand the world around us changes. Through fieldwork and interviews via Facebook, I have learned how this new technology inserts itself into all aspects of a user's life due to the emotional ties within our social lives. As technology intersects with emotion, I begin to wonder, is there such a thing as emotional technology? Furthermore, if an

emotional technology that goes against normative conceptions of technology does exist, what implications does it have for feminists who wish to conceive of the world in a less oppressive and more egalitarian manner?

Opting Out: Trading Motherhood for Employment

Jennifer Stalley '08, *Women's Studies and Political Science*

ADVISOR: Irene Mata, *Women's Studies*, and Rosanna Hertz, *Women's Studies*

In recent years, the media has highlighted a phenomenon dubbed the “opt-out revolution.” Women in the top echelons of the professional working world who appear to have it all – the great job, husband, children – trade in their career and head home. The media claim opting out is becoming a more frequent occurrence, but is it really? Why do some women quit and others maintain both their careers and families? At what cost? After conducting interviews with both working mothers and stay-at-home mothers, I have found complicated, multifaceted reasons for some women's return to a more traditional family set-up. The purpose of this research is to investigate the real reasons women make the decisions they do within the constraints of modern American society.

The Cultural Production of Depression in Asian Americans

Jane Vora '08, *Economics and Women's Studies*

ADVISOR: Irene Mata, *Women's Studies*, and Rosanna Hertz, *Women's Studies*

Asian American females between the ages of 15-24 have the highest rate of depressive symptoms and suicide. For a community often seen as a “model minority,” these statistics do not reflect the stereotypical portrayal of Asian Americans as a well-adjusted and integrated people. In her Womanist ethic of care, Emilie Townes argues that “health is a cultural production,” where our social structures, political institutions, cultures, and histories influence our health status. Her framework

illuminates how U.S. social environments condition the mental health status of Asian Americans. Risk factors documented by psychological studies include social and cultural issues in identifying how depression affects Asian Americans differently, clinicians' cultural competence, and access to care. Racism and the “model minority” stereotype as risk factors are largely unexplored by psychological research but are essential to explaining why depression is a real and prevalent risk for Asian Americans.

Gender and Identity (short talks) Pendleton East 239

Aaron Won't Listen to Alisha: A Study of Gendered Influence across African American and Caucasian Cultures

Elyssa Weber '08, *Psychology*

ADVISOR: Linda L. Carli, *Psychology*

Research shows that men are significantly more influential than women (Lockheed, 1985) and moreover, that men particularly resist women's influence (Eagly & Carli, 2007). Influence differences between males and females begin as early as preschool and like men, boys resist female influence more than male influence. Boys even resist their mothers more than girls do. An investigation of 2-6 year-olds concluded that boys listen more often to their fathers than their mothers, but girls are equally influenced by both parents (Power, McGrath, Hughes, & Manire, 1994). However, this phenomenon may be culture bound. Evidence suggests that women are viewed as more agentic in the African American community than among Caucasians, suggesting that African American boys may be equally influenced by both males and females (Kane, 1992). To test this hypothesis, in this study I assessed how influential male and female puppets were when interacting with African American and Caucasian preschoolers. (Research supported by a grant from the Office of the Dean, Wellesley College.)

3:00 – 4:10

Does Superwoman Eat and Speak: An Empirical Study with Adolescents on the Relationship between Eating Attitudes, Voice, and the Superwoman Ideal

Halina Dour '08, Psychology

ADVISOR: *Sally A. Theran, Psychology*

The current study will examine the relationship between eating attitudes and two of its potential risk factors, level of voice and internalization of the superwoman ideal, in over 150 seventh- and eighth-grade students. Previous research has found that unhealthy eating attitudes and behaviors predict eating disorders in adolescents. It is expected that low levels of voice, defined as the difficulty one has in expressing his/her thoughts, feelings, and needs in relationships, will positively correlate with unhealthy eating attitudes and depression. We also expect to find a correlation between unhealthy eating attitudes and internalization of the superwoman ideal, defined as an unachievable internalization of both masculine and feminine characteristics. This study will be the first to examine the relationship between all three variables in male and female adolescents. (Research supported by Office of the Dean of the College and Psychology Department.)

Defying the Odds: Contemporary Black Women in Science, Medicine, and Public Health

Carmella Britt '08, Africana Studies

ADVISOR: *Susan Reverby, Women's Studies*

This documentary project has grown out of my course work in The History of American Healthcare: Race, Class, and Gender last spring. The goal of this documentary project is to not only record Black women's story, but celebrate their accomplishments as being a Black woman leading in the fields of health and science. Although there has been extensive work on the history of these Black female physicians, there still isn't a lot of information. The absence of scholarly information on the contemporary Black women in healthcare is what inspires me to focus on this current time frame. What I explore in my

project are the contemporary stories of Black women in healthcare. It is interesting to note if whether or not these women's stories are similar despite their generational differences, and if the support systems are the same. I want to know if much has changed in the lives of elite Black professional women from Jim Crow to the present day, specifically, Black women in science, medicine, and public health in one of the most geographically predominant areas for scientific and medical advancement, Boston, MA. (Research supported by the Pamela Daniels '59 Fellowship.)

Literature and the Arts

New York City: Visualizing Urban Ideals (panel) Pendleton East 139

Elizabeth Kim '09, English, and Erica

Kim '08, English and Art History

ADVISOR: *Kathleen Brogan, English*

Whether through print, pixels, or fashion, visual images of New York City have shaped the American public's ideas of the city. By capturing the interaction between children and the streets of New York's poorest neighborhoods, photographer Helen Levitt portrays New York City as a place of self-expression, self-invention, spectacle, and ambiguity. Home to world headquarters of many fashionable high-design labels coupled with a history of extravagant consumerism, it is hardly surprising that New York City is considered the fashion capital of the world. One of the most highly acclaimed and popular television series of the last decade, "Sex and the City" highlights the significance of fashion to personal identity and metropolitan culture. In analyzing photography, television, and fashion, we reveal how visual representations contribute to the public's image of New York City.

Putting It Together: A Study on the Work of Stephen Sondheim (interactive teaching presentation) Jewett Auditorium

Jessica Z. Forde '08, Political Science

ADVISOR: *Lawrence Rosenwald, English*

Critics of Stephen Sondheim have credited him as the "most important force in American musical theater." Some even have declared him, "the greatest living American composer after Copland." Popular musicals such as "Rent", "Wicked," and "Putnam County Spelling Bee", list Sondheim as one of their musical influences. Sondheim bridged the gap between the golden age of musical theater and the modern musicals with his wit, intelligence, and insight into human nature. Sondheim took musical theater outside its vacuum to interact with other cultural movements. In particular, he brought influences from Brecht into his work. Moreover, Sondheim stopped the tradition of pandering to "heterosexual-middle class values" and began to challenge these norms. This concert and presentation examines the songs of Stephen Sondheim with musical examples from student performers. It explores the ways in which Sondheim's musicals are unique based on their themes, musical influences, technical complexity, dramatic effects, and lyrical quality.

Art for the Ages (short talks) Science Center 104

Towards a National Identity: Viollet-le-Duc and the Origins of a 'French Gothic Style'

Louren Hernandez '08, Architecture and French

ADVISOR: *Lara Tohme, Art*

France in the mid-nineteenth century was plagued with an identity crisis. The Revolution had undermined absolute monarchy, but was followed by a sequence of two Republics, a Monarchy, Restoration, and an Empire -all before 1850. Within this context of political and social upheaval,

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Eugène-Emmanuel Viollet-le-Duc (1814-1879) emerged as both a celebrated architect, and as a welcome voice of national pride and values. Viollet-le-Duc's restoration of Notre Dame de Paris (1845) was part of a larger movement to preserve the rapidly disappearing structural remains of Gothic culture in France. While this impetus to salvage those remains was born out of a nationalist sentiment, it was only a brief episode in the historiography of what came to be characterized as the "Gothic" style. This study examines the evolution of the term "Gothic", and the relevance of Viollet-le-Duc's work, in particular at Notre Dame, to the development of a "French Gothic Style".

Ogden Codman's Interiors at The Breakers and a Longing for the Ancien Régime

Quillan Rosen '08, *Art History*
ADVISOR: Rebecca Bedell, *Art*

Ogden Codman, in addition to being the co-author with novelist Edith Wharton of the highly influential *The Decoration of Houses*, was a successful interior designer from the 1890s through the 1920s. One of his most famous commissions comprises the upper floors of The Breakers mansion in Newport, Rhode Island. These rooms are not only significant as an example of Codman's Louis XV and XVI style, but also as a symbol of the widespread contemporary interest in eighteenth-century France, especially among the socially aspiring nouveau riche who wished to be associated with the former monarchy in order to legitimize their power and social standing. This interest was also reflected in the work of other designers and in literature, theater, and fashion. (Research supported by funds from the McNeil Program for Studies in American Art and Architecture.)

Original Creative Work

Indie Film Festival (film) Collins Cinema

The Yemeni Qabili: Tribesman, Not Cavemen

Alia A. Radma '10, *Film and Media Studies and Middle Eastern Studies*
ADVISOR: Salem Mekuria, *Art*

Yemenis are generally portrayed as terrorists or enemies of the West. Even among Arabs, Yemenis are misunderstood. Because of their conservative lifestyles, Yemenis have had to overcome prejudices from all sectors. The objective of my project is to confront the stereotypes and reveal a different Yemen, one that is also known as Arabia Felix (Happy Arabia). This presentation will exhibit the importance of the tribal system and what makes a Yemeni a Yemeni. I will also use my personal experiences of a woman returning to her home after ten years and the realization that saying I am a Yemeni does not suffice anymore.

My name is Alia Ali, daughter of the Radman house from the Qubayta Tribe in Ta'iz of the Central Highlands in Yemen.

Even Spielberg Started Small

Ellis Friedman '08, *Cinema and Media Studies*
ADVISOR: Maurizio Viano, *Italian Studies*

Not that I'm the next Spielberg, but how does a student filmmaker get her start? With a lot of work, a little money, and a laptop. I will first screen my short film, a dark comedy that focuses on two couples in and out for an evening of fine dining gone awry. I will describe how eight months of work turns into a 15-minute movie, from writing the script to designing the credits. You'll learn the tricks of the medium, editing strategies, and the most important things I learned about how to get a film made. (Production supported in part by the Anderson/Davis Museum Grant for Student Filmmaking.)

Science and Technology

What a Nucleus Can Do for You: Magnetic Resonance Research at Wellesley (panel) Science Center 277

Studying Crayfish Neural Activity with MRI

Olivia Hendrick '08, *Neuroscience*
ADVISOR: Nancy H. Kolodny, *Chemistry*,
and Barbara Beltz, *Neuroscience*

Magnetic Resonance Imaging (MRI) has been utilized widely to study systemic structure and function noninvasively in vertebrates. We are developing a new technique to study neural function in invertebrates using manganese (II), which enters neurons through voltage-gated calcium ion channels during periods of neuronal activity and selectively enhances those regions of the brain and nervous system that have been recently active. To discover an optimal stimulation protocol for crayfish (*Cherax destructor*) photoreceptors, the effects of varying the timing and intensity of light pulses were examined by extracellular recordings from the optic nerve. The resulting optimal stimulation protocol will be used to develop Activity-induced Manganese-dependent MRI (AIM MRI) by comparing signal intensities of brain and optic nerve MR images with and without the light stimulus. (Research supported by Merck/AAAS Undergraduate Science Research Program.)

Using NMR Spectroscopy to Evaluate the Mechanisms of pH Homeostasis in *Synechocystis* sp. Strain PCC 6803

Jessica Tse '09, *Biological Chemistry*, and Yih-Chieh Chen '10, *Chemistry and French*
ADVISOR: Nancy H. Kolodny, *Chemistry*, and Mary Allen, *Biological Sciences*

In our study, we utilize ^{31}P Nuclear Magnetic Resonance (NMR) Spectroscopy to noninvasively determine the ability of cyanobacteria *Synechocystis* sp. Strain PCC 6803 to regulate their internal pH. ^{31}P NMR spectra include signals of cell metabolites such as inorganic phosphate (Pi)

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and ATP that are identified by their chemical shifts. Since the chemical shift of inorganic phosphate is pH sensitive, we were able to determine whether the internal pH of cyanobacteria is maintained at homeostasis by experimenting with cells under ideal and acid-stressed conditions. A titration curve showing the relationship between chemical shift and pH was produced with a solution of Pi at known pHs and the same ionic strength as the cyanobacteria. We use this titration curve and our NMR spectra of the cells to determine the cells' internal pH. (Research supported by the Merck/AAAS Undergraduate Science Research Program and the Howard Hughes Medical Institute.)

Characterization of Brain Chemistry in a Mouse Model for Rett Syndrome Using Magnetic Resonance Spectroscopy

Elisabeth Hersman '08, Neuroscience and Chemistry

ADVISOR: *Nancy H. Kolodny, Chemistry and Bonnie Ward, Neuroscience*

Rett Syndrome (RTT) is an X-linked neurodevelopmental disorder which is the second leading cause of mental retardation in girls, and for which there is no cure. Longitudinal Magnetic Resonance Spectroscopy (MRS) can be used to non-invasively investigate the brain chemistry in a mouse model for RTT. We calculate the metabolite concentration ratios choline/creatine (Cho/Cr) and N-acetylaspartate/creatine (NAA/Cr) by integrating the corresponding peaks of the MR spectra obtained on post-natal days 21/22, 35/36 and 42/43. Preliminary data suggest that postnatal day 35/36 is an important time in development, because at that point the Cho/Cr and NAA/Cr ratios are lower in females with Rett syndrome compared to wild-type. This information may be useful in understanding the source of the symptoms, and in future studies to determine the relative efficacy of putative treatments. (Research supported by the Roberta Dey Staley and Karl A. Staley Fund for Cancer-related Research and the Howard Hughes Medical Institute.)

Designing a Surface Coil and Modifying a Three-Dimensional Imaging Technique to Enhance Magnetic Resonance Image Quality

Sahr Khan '09, Chemistry

ADVISOR: *Nancy H. Kolodny, Chemistry*

Surface coils are flat resonators which, when placed in close proximity to the region of interest of an animal/sample in a magnet, produce high quality Magnetic Resonance (MR) images and spectra. MR studies at Wellesley College have previously been done using a whole-body resonator instead of surface coils. In order to obtain higher-resolution localized images and spectra, we have designed and built a new receive-only surface coil which resonates at the Larmor frequency of protons in our Bruker Avance (400 MHz, 9.4 Tesla (T), 8.9 cm vertical bore) micro MRI system. We have also optimized parameters of different three-dimensional T₁-weighted gradient echo pulse sequences which can be used to produce fast, high-resolution 3-D images in our ongoing mouse and crayfish studies. (Research supported by the Howard Hughes Medical Institute.)

Manganese-enhanced MRI for Mice

Mehvish Mehrani '08, Neuroscience, and Sherry Zhou '10

ADVISOR: *Nancy H. Kolodny, Chemistry, and Bonnie Ward, Neuroscience*

Manganese-enhanced MRI (MEMRI) is being developed to improve delineation of brain structures and perform functional studies on mouse models for neurodevelopmental disorders such as Rett Syndrome. MEMRI offers a unique approach to enhancing contrast in T₁-weighted MR images and is increasingly being used for animal studies in the brain and spinal cord. Manganese (II), an analog for calcium (II), enters excitable cells through voltage-gated calcium channels and is transported in axons. Upon accumulation in the brain, divalent manganese ions alter T₁ and T₂ MRI relaxation times. In our study, manganese (II) was delivered through intraperitoneal injections to deter-

mine viable concentrations of the contrast agent and to monitor any behavioral or physical changes resulting from the injections. The manganese accumulates in the hippocampus and differences in signal intensities are determined using T₁ measurements. (Research supported by the Howard Hughes Medical Institute and the Roberta Dey and Karl A. Staley Fund for Cancer-related Research.)

Children: Language and Imagination (short talks) Science Center 396

Understanding the Mind: The Roles of Inhibitory Control and Complex Language

Madeline Harms '08, Psychology

ADVISOR: *Jennie E. Pyers, Psychology*

Children gradually become less egocentric with age, but they do not seem to understand that people can have beliefs that differ from reality until around the age of four. With this false-belief understanding, children demonstrate a mature theory of mind, the ability to attribute mental states to others. Existing research suggests that both executive function and language development contribute to false-belief understanding. In particular, inhibitory control (self-regulation) and mastery of complex grammatical structures have shown positive correlations with false-belief understanding. This study is the first to longitudinally examine the relative contributions of each of these factors to false-belief understanding in English-speaking children. Thirty-two preschoolers received a battery of tasks assessing complement mastery, inhibitory control, and false-belief understanding twice over the course of three months. The results of this study will determine which factor – mastery of complex language or inhibitory control – contributes more to children's understanding of false belief. (Research supported by a Schiff Fellowship.)

3:00 – 4:10

Parents' Reports of Their Children's Relationships with Imaginary Companions

Svetlana Roskin '10, Psychology
 ADVISOR: *Tracy Gleason, Psychology*

How do preschoolers perceive social interaction? When a child creates a relationship, are these interactions similar to or different from real interactions? Many preschoolers create relationships with imaginary companions, and these special friends generally fit into one of two categories: invisible companions or personified objects (e.g., a stuffed animal or doll that the child treats as real). Using parent interviews, I examined the relationships that children form with these two types of imaginary companions, by looking at children's interactions with imaginary companions, the roles these pretend friends played in preschoolers' lives, and the way these relationships were similar to real interactions. These analyses provide information on children's understanding of relationships generally and suggest reasons why children create imaginary companions. Furthermore, by examining the ways in which these children's parents discuss imaginary companions, we gain insight into the way adults perceive their children's relationships with imaginary companions.

Children's Reports of Relationships with Real Friends and Imaginary Companions

Neon Brooks '08, Psychology
 ADVISOR: *Tracy Gleason, Psychology*

How do preschoolers think about peer relationships? Because a child has sole control over relationships with imaginary companions, studying these relationships offers a unique window into how children perceive and construct relationships. In this study, I analyze interviews with three groups of children: children with invisible imaginary companions; children with personified objects (e.g., a stuffed animal or doll animated by the child), and children who do not have imaginary companions, who are interviewed about a real friend. By looking at the similarities between

reported interactions with imaginary companions and with real friends, I am able to draw conclusions about how children represent social relationships. Additionally, by examining differences in how descriptive children are when talking about real and imaginary friends, we gain an appreciation for the function of the imaginary companion as a conversational tool.

Are You a Mind Reader?

Sana Aslam '10, Neuroscience
 ADVISOR: *Jennie E. Pyers, Psychology*

Second-order false-belief understanding is the understanding that people can have beliefs about the beliefs of other people. That is to say, I understand that Mia thinks that Sara thinks her dog is green. This awareness normally develops in children between the ages of six and seven. However, many language-delayed children, like those with autism, struggle with understanding these complex mental states. It is unclear however, whether their struggles result from an inability to follow the complex language of the traditional measures of second-order false-belief understanding, or from a true failure to understand this concept. Currently, there are no second-order false-belief measures that do not require complex language to administer. We have been testing the validity of several different nonverbal measures of second-order false-belief understanding with a normal adult population. If these tests are successful, we hope to modify them for use with several low-verbal populations. (Research supported by a Sophomore Early Research stipend.)

Sloths and Invasive Species: Not in My Backyard (short talks) Pendleton West 117

Behind Enemy Lines: Understanding Purple Loosestrife

Laura Cox '10, Political Science
 ADVISOR: *Kristina N. Jones, Biological Sciences/Botanic Gardens*

Purple loosestrife is a very aggressive invasive plant species that can destroy natural plant communities. This plant is not just a threat to the outside environment, but also affects Wellesley College's natural environment. With this in mind, purple loosestrife was grown in the greenhouse from seeds found on campus. These plants received a variety of treatments to mimic the environment surrounding them in an effort to determine what factors influence their growth and rampant reproduction. These treatments included: exposure to pokeweed juice (pokeweed is another competitive plant on campus, but is native); exposure to run-off from fertilized grass; and direct exposure to fertilizers. The five-month experiment allowed time to observe the entire growth cycle, from germination to seeding, for the purple loosestrife and gave ample insight to the plant's growth in relation to its surroundings. (Research supported by the AT&T (BellSouth) Mentoring in the Sciences Gift.)

Microsatellite Markers for the Study of Invasive and Endemic Weevils from the Galápagos Archipelago

Peggy Chen '09, Biological Sciences, and Susan Downer '08, Biological Sciences
 ADVISOR: *Andrea Sequeira, Biological Sciences*

Our project involves the use of powerful molecular tools to address evolutionary and conservation questions in a susceptible island archipelago: The Galápagos Islands. This research seeks to elucidate the effects of processes that can cause rapid evolution in populations of introduced species, and if these introductions can displace or affect closely related island endemics. Additionally, for endemics this research

3:00 – 4:10

explores the effect of a complex topography on patterns of genetic variability. DNA microsatellite loci present many advantages compared to other variable markers such as sequences of maternally inherited loci (mitochondrial DNA). The high variability and codominant nature of microsatellites make them a particularly sensitive marker for detecting short-term population changes such as demographic bottle-necks allowing us to study both the invasive species *G. howdenae*, and the endemic to the young and topologically complex island of Isabela, *G. williamsi*.

Aberrant Vertebral Morphology in Sloths: When the Exceptions Tell Us More

Courtney Stepien '08, Biological Sciences
 ADVISOR: *Emily Buchholtz, Biological Sciences*

“One more defect and they would cease to exist,” Buffon quipped in 1765. Sloths are exceptional. Tree sloths *Choloepus* and *Bradypus* comprise two of three genera that break the seven-cervical vertebrae mammalian constraint. *Choloepus* displays reduced cervical vertebral counts while *Bradypus* displays enhanced counts. Phylogenetic relationships between the genera indicate independent origins of arboreality and anomalous counts, but don’t explain the mechanism by which the counts arose. Recent molecular evidence suggests that lateral components of vertebrae – limbs, distal ribs, and the sternum – are patterned separately from the axial vertebral column. A mismatch between axial and lateral patterning may cause ribs to appear at nontraditional positions along the vertebral column. Our data suggest that in sloths, patterning of lateral components has changed relative to axial components; the constraint has not been violated, but lateral patterning has been disrupted. (Research supported by a Schiff Fellowship.)

A Chemical Approach to the Treatment of Diabetes (panel) **Pendleton West 116**

Leslie Kim '08, Biological Chemistry and English, Taylor Lenton '08, Chemistry, Kathryn Lipford '08, Biological Chemistry, Grace Logan '08, Economics, Susan Smith '08, Biological Chemistry, and Margaret Thompson '08, Chemistry
 ADVISOR: *David R. Haines, Chemistry*

Type 2 diabetes is an escalating public health problem in this country and around the world. In order to treat this disease, research efforts are focusing on therapeutics that reinstate pancreatic insulin production. The Haines lab is studying the molecular interactions between a small peptide, glucagon-like peptide-1 (GLP-1), that regulates insulin production and release, and its membrane-bound receptor GLP-1R. Our current research involves two separate approaches to this problem. One project explores the properties of GLP-1 that allow it to bind to the receptor and activate it. A second project investigates how a small molecule can bind to GLP-1R and turn off its ability to regulate insulin. Ultimately, the results from each of these projects will inform the development of new treatments for diabetes. (Research supported by the Brachman Hoffman Fund, the Staley Fund for Cancer-related Research, the National Science Foundation Research Experience for Undergraduates Chemistry and Physics Grant, the Marie and John Zimmermann Foundation, the Howard Hughes Medical Institute, and the Norris-Richards Undergraduate Summer Research Scholarship.)

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Literature and the Arts

Explicating Darkness: Literary Theory and Joseph Conrad's *Heart of Darkness* (panel) Pendleton East 139

Judy Luo '08, *French*, Megan Skillman '08, *English*, Sumita Chakraborty '08, *English and Creative Writing*, Julie Camarda '08, *English*, and Kaitlin Staudt '08, *English and French*

ADVISOR: Yoon Sun Lee, *English*

Following its seminal publication in 1902, Joseph Conrad's *Heart of Darkness* sparked passionate literary debates that have endured for over a century. Based on our work in Professor Yoon S. Lee's English course on literary theory and criticism, we have developed individual theoretical approaches to *Heart of Darkness*, dealing with a gamut of theorists, critics, and issues, from feminism to Foucault. We hope to use this particularly rich novel to illustrate, analyze, question, and discuss the relationship between theory and text.

During the panel, the panelists will propose the following theoretical approaches to *Heart of Darkness*: Judy Luo will approach the text with Foucault's concepts of power, Megan Skillman will explore the relevance of Derridian theory, Sumita Chakraborty will discuss the Althusserian idea of interpellation, Julie Camarda will delve into feminist theory, and Kaitlin Staudt will comment on Edward Said's postcolonialist interpretations of the text.

New Korean Cinema: The Surge of Hanryu Hits South Korea (interactive teaching presentation) Collins Cinema

Terry Kim '08, *Cinema and Media Studies*
ADVISOR: Maurizio Viano, *Italian Studies/Cinema and Media Studies*

Recently, there has been a great amount of interest given to New Korean Cinema. To name just a few, directors like Sang-soo Hong, Ki-duk Kim, Chan-Wook Park, Chang Dong Lee, and Joon-ho Bong have recently made famous/infamous films that made South Korea a noticeable rookie in the film world. We will focus on three films: *Oasis* (directed by Chang Dong Lee), *Tale of Two Sisters* (directed by Ji-woon Kim), and *I'm a Cyborg, But That's OK* (directed by Chan-Wook Park). Lee's film illustrates how entrance into various film festivals creates "director brand names" for certain directors. Kim's film illustrates how a horror genre can be tailored to appeal to a wider audience. Lastly, Park's film illustrates how the use of the "star system" transforms a small Korean film into a large Asian one.

Political Development

The Legacy of British Imperialism: Colonial Development, the Rise of Nationalism, and Postcolonial Identity (panel) Science Center 278**The Uganda Railway and Imperial "Development"**

Helena Pylväinen '08, *International Relations and History*
ADVISOR: Y. Tak Matsusaka, *History*

Immediately dubbed "The Lunatic Express" by critics in the British Parliament, the Uganda Railway never promised much by way of development; on the contrary, its main purpose was to beat the Germans to effective occupation of Uganda and (supposedly) protect the Suez Canal through control of the

Upper Nile. However, the £5,502,592 bill forced the British to find a way to make the railway profitable, leading to the formulation and implementation of technocratic visions aimed at molding East Africa into a self-sufficient satellite of the British Empire. The results, of course, were mixed. This presentation discusses the complex ways in which the Uganda Railway transformed social, political, and economic life in Kenya and Uganda. (Research supported by a Schwartz Fellowship.)

The Process of Partition: Communalism and the Rise of the Hindu Right

Shelly Anand '08, *History and Spanish*
ADVISOR: Nikhil Rao, *History*

The partition of India and Pakistan did not begin on August 15, 1947, but as an idea early in the twentieth century and continues as a reality today. By examining the context of religious revivalism both as an invented identity of colonization and as an inherent ideal for religious groups in India, I will discuss the narratives of many Punjabi Hindu Nationalists who migrated to India from what is now Pakistan. Hindu Nationalists debated with members of the Muslim League and other groups over how to make the nation truly independent, discussing issues such as representation in the new government and choosing a national language. Furthermore, Partition caused rifts not only on communal or sectarian lines, but also along regional and ideological lines. Thus my work illustrates the trajectory of partition from invented British colonial definitions of identity to the way these identities were internalized and continued after Independence. (Research supported by a Schwartz Fellowship.)

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Irish and Indian Anticolonial Nationalism in the Metropole: London, the Interwar Years

Katharine Harper '08, History
 ADVISOR: *Nikhil Rao, History*

A comparative study of Irish and Indian nationalism in the late-colonial era reveals a number of similar themes and obstacles in the elite formations of national identity. Visions for a postcolonial nation were often divided between a religious, ethnic interpretation of national identity and the lure of a more modern, often socialist overthrow of Empire. Not mere products of cultural coincidence, intellectual elites of Ireland and India often found themselves in London. Through movements such as Labour, Theosophy, and modernist literature, the anticolonial nationalist dialectic was played out within the cultural bounds of the city. Intellectual currents interacted with Indian and Irish expatriate populations to construct a political narrative that was aware of, yet distinct from, corresponding anticolonial movements within India and Ireland themselves, and attached instead to the metropole of the Empire. (Research supported by Schwartz Fellowship.)

Science and Technology

The Science of Nanomaterials (panel) Pendleton West 212

Shloka Ananthanarayanan '08, Biological Chemistry, Alexandria J. Bear '09, Chemistry, Gabrielle N. Gantos '10, Chemistry, SeongEun Kim '09, Chemistry, Krystal S. Lee '08, Biological Sciences, Christine Min '10, Chemistry, and Julia C. Thomas '09, Chemistry
 ADVISOR: *Nolan T. Flynn, Chemistry*

Nanoscience – the study and use of materials with nanometer length scales – has the potential to revolutionize numerous fields because nanomaterials make new and useful properties accessible. From the creation of novel therapeutic systems to the modification of the surfaces of existing

biomedical devices, nanomaterials are being explored for biomedical applications. Our research projects focus on developing the toolkit necessary for making nanoscale biomaterials and understanding their properties. We will describe our work with thermoresponsive polymers, surface modified metallic nanoparticles, and composite materials containing both. (Research supported by a Schiff Fellowship, the Brachman Hoffman Fund, Howard Hughes Medical Institute, AT&T (BellSouth) Mentoring in the Sciences Gift, and National Science Foundation.)

Modeling of Vision and Physics (short talks) Science Center 396

Modeling the Transformation from LGN to V1 Color-opponent Receptive Fields

Sarah M. Maynard '08, Physics
 ADVISOR: *Bevil R. Conway, Neurosciences*

Color arises from a network that begins with the cones and progresses through stages of processing involving cells in the lateral geniculate nucleus (LGN), primary visual cortex (V1), and prestriate areas. Representation of color along the red-green axis is derived from an opponent process whereby responses from medium-wavelength (M) cones are subtracted from those of long-wavelength-selective (L) cones, leading to Type I L/M cells in the LGN. Color contrast arises through double-opponent receptive fields defined by spatial and color opponency in both center and surround. Recent physiological studies have identified such double-opponent receptive fields in V1 and characterized them with high-resolution spatial maps. Our model considers known variations of red-green Type I cells as building blocks, defined by a difference of Gaussians and sizes of center and surround based on experimentally observed values, of physiologically characterized double-opponent cells to understand the spatiotemporal response properties of V1 neurons.

Catching Balls: What Visual Cues Are Used to Judge the 3-D Trajectory of a Moving Object?

Rosa-Lynne B. Fernando '08, Neuroscience and Computer Science

ADVISOR: *Ellen C. Hildreth, Computer Science*

We created a virtual ball-catching task that simulates a fly ball launched from a central point and had human subjects predict where the ball will land. Many properties in the task were changed such as the ball's absolute size, its varying size throughout the trajectory, the presence of a background grid as a reference point and the percent of the flight trajectory shown to the viewer. Analysis of the viewers' catching paths and final landing site predictions as a function of our variables helps to determine which visual cues are used to perform this task. This study also addresses the extent to which viewers predict the ball's flight trajectory as opposed to relying on a self-correcting tracking strategy while the ball is in flight. (Research supported by Howard Hughes Medical Institute.)

Variational Monte Carlo Method Applied to Spins in 2-Dimensional Square Lattices with Zero Doping

Sunita Kannan '08, Physics and Mathematics

ADVISOR: *Courtney Lannert, Physics*

My research involves the theoretical study of cuprates, which are compounds whose elements are sandwiched between copper oxide, square lattice plane layers. We know that when electrons are removed from these planes (through "doping") the electron interactions change. The specific aim of my thesis is to find the best possible model at zero doping. This involves taking a model Hamiltonian (in the form of the Extended Heisenberg Hamiltonian), determining its groundstate wavefunction by the Variational Monte Carlo method (which involves testing different "trial" wavefunctions – specifically the striped and the "checkerboard" wavefunctions), then using this groundstate wavefunction

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to determine the magnetization predicted by that model. By comparing this magnetization with experimental results, I can find the most suitable model. Using that model, we can find the way the electrons interact with one another in that particular state because, at its core, the Hamiltonian essentially encapsulates the way the electrons interact. (Research supported by Research Corporation and a Schiff Fellowship.)

Social Analysis

Climate for Change: A Look at Wellesley's Greenhouse Gas Emissions (panel) Pendleton East 239

Amy Harrington '09, English and Environmental Studies, Alexander Jenko '08, Systems Engineering (Olin), Samantha Jones '08, Environmental Studies, Monisha Khurana '08, Environmental Studies, Margaret Weirich '08, Political Science, Courtney Streett '09, Environmental Studies and Africana Studies, Amanda Tai '09, Environmental Studies, and Anli Yang '09, Environmental Studies
 ADVISOR: *Beth DeSombre, Political Science*

One of the biggest issues facing our generation is climate change. While we are a part of the problem, we can also be a part of the solution. The Environmental Studies capstone course has devoted the semester to assessing Wellesley College's greenhouse gas emissions, making recommendations that will help Wellesley reduce these emissions, and evaluating ways in which the College can meet the requirements of the American College and University Presidents' Climate Commitment. Using a commercial carbon calculator to measure emissions, we have estimated the College's contribution to climate change across the areas of energy, transportation, land use and waste. By educating the campus community about the steps we can take to reduce greenhouse gas emissions, we can begin to shrink Wellesley's environmental footprint.

Not Just Grass: Sustainable Farming at Wellesley College (panel) Pendleton East 339

Margot Munger '08, English, Tamar Wolfson-Seeley '08, Mathematics, Eliza Murphy '10, Studio Arts, and Jo Murphy '09, Peace and Justice Studies and Classical Civilization
 ADVISOR: *Kristina N. Jones, Biological Sciences/Botanic Gardens*

As sustainability becomes a common buzzword, it is important for our community to back up this word with actions that work. Food is critical, and indeed is one of the areas requiring the most change, as food production has a long history of not always providing for the needs of the population. In order to create a more self-sustaining community, we must reconstruct how food is eaten, produced, transported, and ultimately, grown. At Wellesley, we have started a farm that uses sustainable techniques. With the formation of this farm, we have begun to build relationships with Dining Services and El Table Cooperative Cafe. Our presentation will include a history of the Wellesley College farm project, as well as more general information about the sustainable food movement. This presentation is recommended to anyone interested in learning how to make healthy food choices for themselves and their community at large.

Philosophy and the Construction of Knowledge (short talks) Science Center 277

The Role of Status Anxiety and Emotion in Intellectual Conflict: The Case of Karl Marx and Mikhail Bakunin

Sanja Jagesic '08, Sociology and German Language and Literature
 ADVISOR: *Thomas Cushman, Sociology*

Intellectuals as a group are defined, and define themselves as rational, disinterested, truth-seeking individuals. As a result of these characteristics being ascribed to intellectuals, they occupy a privileged space in society. Because of

their presumed disinterest, their ideas are often accepted as the most correct, as uncorrupted by the need for financial and other forms of gain. However, studies of interactions among intellectuals reveal that they cannot simply be defined as disinterested and purely rational. Instead, it is evident that factors such as nonrational emotional arguments and status anxiety play a significant role in the work of intellectuals. In my presentation, I analyze these factors by looking at the case of intellectual rivalry between the nineteenth-century radical theorists Karl Marx and Mikhail Bakunin. This research is based on a qualitative content analysis of the theoretical writings and letters by each theorist. (Research supported by a Schiff Fellowship.)

México's Visionary: José Vasconcelos and *The Cosmic Race*

Aubre Carreón Aguilar '08, Latin American Studies and Music
 ADVISOR: *Alejandra Osorio, History*

José Vasconcelos was a writer, a philosopher, an educator, and a politician. He was one of the more influential intellectuals in México's early history. In *La Raza Cósmica [The Cosmic Race]*, published in 1925, Vasconcelos envisioned that the Americas would produce a hybrid or "cosmic" race that would generate a new era of humanity. This new era would be based on the joy and love of knowledge and not on skin color, ethnicity, or convenience.

Vasconcelos' work has often been read as a racist text. I propose an alternative reading, one which understands race within the debates intellectuals like Vasconcelos took part in the early twentieth century. I argue that Raza then was understood in spiritual and cultural terms rather than biological ones. The controversies that have surrounded Vasconcelos's writings are due in great part to this misinterpretation. I propose further that in order to more fully understand Vasconcelos' theories one must look at his intellectual development historically and consider, among other things, his growing up during



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El Porfiriato, the impact of positivism and of the Mexican Revolution in his thinking as well as his appointment as the first Secretary of Education in 1921. It is only in this historical context that one can better understand Vasconcelos' idea about the Cosmic Race.