

## Humanities

**The Way We Were**

(short talks) Pendleton Hall East 239

**Harnessing Visibility: Creating Perspective in Narrative Film***Lauren E. Chen '14, English*ADVISOR: *Luther Tyler, English*

Film is a medium in which realistic representation not only combines but also collides with fantasy, where these two contradictory elements of storytelling both intertwine and coalesce to create new perspectives. Film is a marriage of the real and the fake, the building and breaking down of illusion that helps to create cinematic perspective. The creation of cinematic perspective is manifested in filmic self-reflexivity, which will be discussed through close analyses of different films. From Billy Wilder's noir, "Sunset Boulevard," to Ben Affleck's drama, "Argo," the idea of self-reflexivity in film is transcendent of all time periods and genres in Hollywood.

**Shaping Femininity: Middle and Working Class Girls' Schooling in Victorian England***Daisy M. Dowdall '14, History*ADVISOR: *Lidwien Kapteijns, History*

Girls' education experienced major reform in the Victorian period. The emergence of a national education system opened sustained formal schooling to an unprecedented number of working-class girls, while the creation of public girls' schools allowed the majority of middle-class girls to receive rigorous "grammar-school" educations for the first time. But how transformative were these changes, really? Despite the reform, both groups were still trained to be, above all, good wives and mothers who remained within the domestic sphere. This presentation examines the significance of Victorian educational reform through a case study of eight memoirs, including those of Elizabeth Garrett Anderson and Annie Besant. In so doing, it also briefly outlines the process of locating these obscure and sometimes unpublished texts, as well as the importance of the memoir as a historical source.

**So You Want to Pursue a History Thesis? Real Talk About Studying Comedy and the Modern Black Freedom Struggle***Frances G. Leeson '14, History*ADVISOR: *Brenna Greer, History*

Although women are often excluded in the popular memory of both the civil rights movement and black comics in the United

States, the most financially successful, and arguably influential, black comedian of the 1960s was Jackie "Moms" Mabley. She appeared on stage as a bedraggled, grandmother figure that boldly asserted her sexual desires while slyly critiquing segregation, the United States government, and incongruous behavior within majority and minority populations. She used her privileged position to directly contribute to the civil rights movement while assuaging the difficult process of achieving consensus within activist movements. Through a study of Jackie Mabley and the communities she created around her comedy, I found justification to broaden our definitions for political action and activism. (Research supported by a Schiff Fellowship)

**Oral Histories of Wellesley Alumnae of African Descent from the Pre-Ethos Era***Nora E. Mishanec '14, Cognitive & Linguistic Sciences and Psychology*ADVISOR: *Brenna Greer, History*

In the fall of 1958, eight first-years of African descent enrolled at Wellesley as members of the Class of 1962. It was a turning point for the College, as previous classes had never graduated more than three or four students of African descent. With funding from the Office of the Provost and the Pamela Daniels Fellowship, I collected oral histories from alumnae of African descent of the 1950s and early 1960s, who attended Wellesley before the founding of Ethos. The project was inspired by an assignment in Professor Brenna Greer's history course titled 'Modern Black Freedom Struggle.' This oral history collection--housed in the Archives--documents an important chapter in the College's history, one that requires us to reexamine the typical narrative of students of African descent at Wellesley. (Research supported by a Daniels Fellowship)

**Bells, Ballet, Medicine & Museum**

(short talks) Pendleton Hall West 212

**The Carillon, Ringing in the Community***Tiffany Chen '15, Spanish*ADVISOR: *Tamar Barzel, Music*

The carillon, an instrument consisting of bells played through manuals and a pedal-board, is an oft-heard but little-known treasure on Wellesley's campus. Familiar to most as the "bell tower," students in the Wellesley Guild of Carillonneurs, a group of musicians with an enthusiasm for bells, ascend the bell tower to play pieces ranging from baroque sarabandes all the way to the theme from "Game of Thrones" between classes

and during specific times of ceremony. The bells announce special events and act as timekeepers, but they also shape the campus environment through their unique sound. As a student in an ethnomusicology field methods class, I spent fall semester taking an in-depth look at the Guild's culture and the function the bells fulfill on campus. As a carillonneur myself, I already had an "in" as a participant, but in taking on the role of observer, I realized the Guild has a more integral role in the community and campus environment than I originally understood, with a long history behind it; in fact, plays a crucial role in forming Wellesley's soundscape.

**Chez les Vuillard: Paintings of Disease and Infirmary in Fin-de-Siècle Paris***Michaela R. Haffner '14, Art History and French*ADVISOR: *Margaret Carroll, Art*

The late nineteenth-century French Nabi artist, Édouard Vuillard (1868-1940), engages fin-de-siècle discourses of disease and degeneration in his series of intimiste domestic paintings from 1891-95. These disquieting interiors not only suggest the artist's personal encounter with illness in his shared family home, but also the general spirit of malaise and obsession with morbidity that pervaded turn-of-the-century Paris. His portrayal of the invalid woman evokes the then-common practice of deathbed photography, and his treatment of interior space suggests the dwelling as a polluted and diseased environment. Vuillard subverts the conventional bourgeois conception of the home as a haven, and through a "microbial" aesthetic and a claustrophobic manipulation of space, imbues its very walls with the threat of contagion. My re-historicization of Vuillard within the Parisian medical milieu offers a new understanding of the uncanny reverberations in his deceptively warm and intimate domestic scenes. (Research supported by a Schiff Fellowship)

**Defining the American Vision: The Whitney Museum of American Art's Role in Changing the Landscape of American Art History***Lauren M. Richmond '14, Economics and Art History*ADVISOR: *Rebecca Bedell, Art*

In the early twentieth-century United States, Gertrude Vanderbilt Whitney became one of the most important patrons of American art. Her efforts to promote American artists, whom she believed did not have enough support in the art market, eventually culminated in the founding of the Whitney Museum of American Art in New York. It was one of the first institutions in

the country focusing exclusively on American art. Through the exhibitions, publications, and lectures it offered in its opening years (1931–1937), the Museum played a significant role in defining the character, canon, and history of American art, all while the country was reeling from the stock market crash of 1929. The story it was crafting was often at odds with the one being shaped just blocks away at the Museum of Modern Art.

### **The Powerhouses of Parisian Society: Effects of Female Patrons on the Ballets Russes**

*Emily K. Weddle '14, Music and Art History*

ADVISOR: *Gurminder Bhogal, Music*

The Ballet Russes dominated the avant-garde world of early twentieth century Paris with ballets that brought together the greatest artistic and musical minds of the time. Their ascent into stardom was realized through the hard work of figures like Igor Stravinsky, Erik Satie, Pablo Picasso, and their founder Serge Diaghilev. Alongside these figures, patronesses like the Comtesse Greffulhe, the Princesse de Polignac, Misia Sert, and Coco Chanel contributed greatly to the ballet troupe in four different ways. Yet very few scholars have recognized these women for their significant contributions to the musical, artistic, and financial aspects of the Ballets Russes. Their involvement included work on productions such as *Parade*, *Les Noces* and *Le Train Bleu*, and these four women's roles greatly affected the legacy of the Ballets Russes that remains today. (Research supported by the Jerome A. Schiff Fellowship)

### **The Enemy Race: Incarceration of Japanese Americans in World War II**

(panel discussion) Founders Hall 126

*Emily F. Gamber '14, Women's & Gender Studies and American Studies, Eri R. Ichijo '14, Sociology, Erin S. Moy '14, Media Arts and Sciences, Penny Wang '14, Chemistry*

ADVISOR: *T. James Kodera, Religion*

This Ruhlman presentation will be based on American Studies seminar (318) called “Interning the ‘Enemy Race’: Japanese Americans in World War II. We studied and analyzed the rationale by the United States government for the incarceration of American citizens of Japanese ancestry, and Japanese nationals living in the United States. Our research topics varied from Japan's rise as a colonial power, life in the internment camps, the role of 442nd Regimental Combat Team, and race and politics in post 9/11 America. We will each discuss our research project, which

will give a coherent historical view of how the Japanese and Japanese Americans were treated by the US government during World War II.

### **How to Find the Grownup Secrets: A Collection of Poems** (literary reading) Pendleton Hall West 220

*Lisa A. Ventura '14, Computer Science*

ADVISOR: *Frank Bidart, English*

This project probes the delicate or brash ways a person formulates their own identity. Though identity is often incorporated into poetry, this project differs because the focus rests more on conscious changes to the elusive self and the internal complexity of molding oneself. These poems explore the way a voice can be mutilated or empowered or silenced by the heightened consciousness of its identity among other living participants. By investigating the speaker's interactions and observations, we discover changes in perspective and self-awareness.

### **Human Masks**

(exhibition) Jewett Arts Center Art Gallery

*April P. Zhu '14, Environmental Studies*

ADVISOR: *Bunny Harvey, Art*

Humans have covered their faces with masks since early civilization, and throughout history, the mask has fulfilled many purposes—to hide, to protect, to sanctify, to frighten, to entertain. Anthropologically and culturally, masks are artifacts ripe with human narrative, and there is much to be learned. But as an art object itself they offer a creatively fertile space for exploration of symbolism and emotion. Through masks, individuals create extensions of themselves by constructing an external object or image. To me, this is fascinating; my painting series will explore the psychological, cultural, sociological, aesthetic, and spiritual underpinnings of masks.

### **Book Arts Lab Demonstration**

(interactive teaching presentation)

Clapp Library-Book Arts Lab

*Christine E. Campbell '14, English, Elle D. Friedberg '17, Undeclared, Abigail M. Jones '16, Mathematics, Mary J. Morse '15, Undeclared (Olin), Kelsey M. Reiman '15, Media Arts and Sciences*

ADVISOR: *Katherine Ruffin, Library Collections*

An artist's book is a book created by an artist that examines the form of a book itself. Contemporary artists create books both digitally and using traditional methods of letterpress printing, printmaking, bookbinding and paper-making. We will look at examples of artists book and current student works. There will also be a hands-on interactive demonstration of letterpress printing and bookbinding.

### **Al-Ghareeb The Stranger**

(short performance)

Ruth Nagel Jones Theatre, Alumnae Hall

*Sahar S. Ibrahim '16, Undeclared, Amelia M. Redmond '16, Cinema and Media Studies*

ADVISOR: *Nora Hussey, Theatre Studies*

This piece was composed following the events commonly referred to as the Arab Spring in late 2010 to early 2011. It is an ethnodrama comprised of the voices of students attending school abroad, away from their countries and their families, as they witness the tragedies and transformations of the places they call home. These voices come from Libya, Yemen, Bahrain, and Egypt, but may very well represent the voices of all those affected by such conflicts from all parts of the world through time.

## **Science & Technology**

### **Light Matters**

(short talks) Founders Hall 120

#### **The Love-Hate Relationship between Plants and Light: Investigations on High Light Tolerance Mechanisms in *Arabidopsis thaliana***

*Andrea J. Bae '14, Neuroscience*

ADVISOR: *Martina Koniger, Biological Sciences*

Light is a taxing environmental challenge to plants. Although it is necessary for photosynthesis, light in excess of what can be used for photosynthesis can inflict cellular damage, reduce photosynthetic ability, decrease growth, and strain fitness. Despite their immobility, plants manage to tolerate an impressive range of environmental light conditions through a variety of sophisticated acclimation responses. One mechanism plants utilize to acclimate to the drastically changing light variations of the natural world is chloroplast movement. Chloroplast movement involves the physical rearrangement of chloroplasts within the cell to either avoid or maximize light absorption. In addition to chloroplast movement, plants rely on non-photochemical quenching (NPQ), also known as heat dissipation, to minimize light-induced damage through the conversion and subsequent dissipation of excess light into heat. In the Königer lab, we evaluate the relative importance of these fast acclimation responses toward the plant's fitness by studying various *Arabidopsis thaliana* mutants that exhibit genetic impairments related to chloroplast movement or NPQ. In addition, we investigate how different light conditions during growth affect the degree to which plants rely on these mechanisms. Our current investigations have shown that

chloroplast movement and NPQ are sensitive to environmental light conditions during growth. In fact, plants grown under higher light exhibit chloroplast movement to a lesser degree than plants grown under lower light. This may be attributed to differences in chloroplast arrangement between high light plants and low light plants. Additionally, we observed a trend where plants grown under higher light exhibited greater NPQ abilities than plants grown under lower light. Collectively, these findings suggest that a plant's chloroplast movement and NPQ mechanisms are flexible to environmental modulation.

### The Detection of Photons from NV Centers in Diamond

*Carina A. Belvin '16, Physics*  
ADVISOR: *Robert Berg, Physics*

Nitrogen-vacancy (NV) centers in diamond have recently attracted interest for their potential to act as single quantum bits for quantum computers. When excited optically with green light, NV centers will exhibit photoluminescence, emitting red photons. Since a single NV center can act as a single photon source, our goal is to experimentally determine if a given sample contains a single NV center versus multiple centers using the Hanbury Brown and Twiss autocorrelation set up. Because of the finite amount of time it takes to optically excite an NV center, single centers can be identified by verifying that the probability of detecting the arrival of two photons at the same time approaches zero. I have worked on both modeling the autocorrelation data using MATLAB and setting up the photon detection equipment for future experiments. (Research supported by the Center for Integrated Quantum Materials)

### Quantum Effects in Nanoscale MOSFET Devices

*Alexandra L. Day '15, Physics*  
ADVISOR: *Robert Berg, Physics*

MOSFET transistors are a key component of virtually all modern electronic devices, and today's advanced MOSFETs are small enough that quantum mechanical effects become relevant when considering their function and use. This project, completed at the National Institute of Standards and Technology as part of a Society of Physics Students internship, presents a first step in describing the theoretical behavior of nanoscale MOSFETs at low temperature.

### Building a Confocal Microscope for the Study of Nitrogen-Vacancy Centers in Diamond Nanocrystals

*Catherine A. Matulis '14, Physics*  
ADVISOR: *Robert Berg, Physics*

Nitrogen-vacancy (NV) centers are atom-sized defects in diamond and have many potential applications, including storing bits of quantum information and acting as ultra-sensitive magnetic field sensors. In order to manipulate the NV-centers and further investigate these properties, it is necessary to be able to detect single NV-centers. This can be achieved with a confocal microscope. When excited with green light, NV-centers will emit red-orange fluorescence. This fluorescence is strong enough that light originating from a single center can be detected. We are constructing a confocal microscope, using a collection of relatively common optical and electronic parts, which will be able to scan a sample of diamond nanocrystals containing NV-centers and collect images, then focus on and collect fluorescence from a single center. (Research supported by a Schiff Fellowship and the Center for Integrated Quantum Materials)

### On the Night Shift: Staking Out Three Koronis Family Asteroids (panel discussion) Science Center 277

*Anicia Arredondo-Guerrero '16, Astrophysics,*  
*Anne-Marie M. Hartt '16, Undeclared,*  
*Sormeh K. Yazdi '16, Astrophysics*  
ADVISOR: *Stephen Slivan, Astronomy*

For more than a decade students have been using the 24-in Sawyer Telescope at Wellesley's Whittin Observatory to study asteroids in the Koronis family, whose spins have been changed over time by absorption and reemission of sunlight. In the 2014 spring semester we learned how to make quantitative measurements in the night sky using a modern astronomical digital camera on the telescope, in the context of planning and carrying out individual research projects to measure the spinning of three Koronis members. Come learn the stories of enduring long nights of observing (and cloudy nights of non-observing), battling belligerent computers, and the exhilarating rush of achieving our own final results.

## Social Sciences

### Is the Price Right?

(short talks) Science Center 278

### Generational Differences in Attitudes Toward the Economy: The Case of China

*Fiona Fan '17, Undeclared*  
ADVISOR: *Thomas Cushman, Sociology*

In a 2005 poll of Chinese public opinion, 74% of respondents agreed that "a free market economy is the best system on which to base the future of the world". Since the 1978 reform movements in China, the concept of what Adam Smith called "the invisible hand" has gained widespread acceptance in Chinese society. Yet, this acceptance varies by generation. The generation born during The Cultural Revolution was nurtured by a planned economy where consumer values were widely based on the presence of a strong interventionist state that provided extensive welfare benefits. The motivations for their economic choices differ significantly from more libertarian principles that underlay the historical development of Western capitalist economies. This presentation focuses on the generational differences in attitudes toward the free market and their consequences for the future development of Chinese society. Can these generational differences be resolved as China increasingly turns toward a more open economy? How will such differences affect future political developments?

### Optimal Product Design for a Linear Pricing Monopolist

*Sookyo Jeong '14, Economics*  
ADVISOR: *Casey Rothschild, Economics*

This paper studies the optimal product design for a linear pricing monopolist. I ask: what is the profit maximizing strategy for a linear pricing monopolist, while making sure that it is correctly targeting different types of consumers? I demonstrate that such an optimal menu involves products that distort qualities for both types of consumers away from the first best allocations. I also show that while traditional literatures indicate that second-degree price discrimination is deemed to be impossible in a linear pricing market, this is no longer true when products can be differentiated by multiple attributes.

### “Qipu Lu:” Who Really Has It Cheapest? Examining Price Discrimination in Shanghai’s Clothing Markets”

*Berit Paxson-Tarnai '15, Mathematics*

ADVISOR: *Jianfeng Zhu, Department of Sociology, Fudan University, Shanghai*

Price discrimination refers to the socioeconomic phenomenon in which some customers are charged different prices than others for the same or similar goods or services. While studying abroad in China this year I witnessed price discrimination toward foreigners firsthand in purchases made at the Hualian Market and “Qipu Lu” in Shanghai. Based on my experiences and observations, I decided to conduct a controlled study of the phenomenon. A Chinese student and I conducted 50 trials of an experiment to collect data about the prevalence and extent of price discrimination based on nationality and Chinese language ability. We were hoping to learn whether the nationality of the purchaser affected asking price and whether speaking English or Chinese interacted with nationality to affect asking price. The findings were surprising and may have implications for cultural and socioeconomic development in modern Shanghai. (Research supported by a National Security Education Program David L. Boren Scholarship)

### What We Are Paying for: A Constant Quality Price Index for Laptop Microprocessors

*Liyang Sun '14 Economics and Mathematics*

ADVISOR: *Daniel Sichel, Economics*

A microprocessor contains the central processing unit and takes the role of the “brain” for a computer. For the past decades, we have benefited greatly from its technological improvement. To accurately measure the contribution of such technological improvement to the economic growth, we need a constant quality price index, which also helps us understand the quality trend in microprocessors. The quality trend in high-end microprocessors (server and desktop) has been extensively studied. I focus on the low-end microprocessors (laptop) for my senior economics thesis. Using newly collected data on laptop microprocessor prices and performance metrics, I construct the constant quality price index over the past ten years. Across a range of empirical specifications, I note a sharp decrease in price but smaller in magnitude compared to high-end microprocessors. These results suggest a slower technological improvement in the laptop microprocessor industry.

### Race, Identity, and Social Commentary

(short talks) Science Center 104

#### “Who Decides What Art Is...? Lorraine O’Grady (’55) and the Democratization of Art in the Black Community “

*Camylle J. Fleming '14, Women’s & Gender Studies and Africana Studies*

ADVISOR: *Nikki Greene, Art*

It was the presumption voiced by a non-artist acquaintance that “avant garde art does not have anything to do with black people”, that inspired activist, artist and alumna, Lorraine O’Grady (’55) to create her 1983 performance piece, *Art Is...* Carried out on the Adam Clayton Powell Boulevard, during Harlem’s annual African American Day Parade, O’Grady and a team of artists, brandishing antiquated gold frames, ran into the crowd of parade-goers to grant them an opportunity to respond. *Frame me, make me art!* and *That’s right, that’s what art is, we’re the art!*: these were the resounding chants yelled out from the sidelines; waves of smiling Black faces, that have historically been obscured, commodified and ‘otherized,’ finally came into view. Though the 43 color photographs that chronicle her parade piece serve as one of O’Grady’s least known works, the remarkable manner in which she reclaims subjectivity, personhood, and the sanguine liveliness of the black community should not go overlooked.

#### In Their Own Words: Documentary Theater as Social Commentary

*Vannessa K. Greenleaf '14, Theatre Studies and English*

ADVISOR: *Diego Arciniegas, Theatre Studies*

The Los Angeles riots. The murder of a gay teen in Laramie, Wyoming. Vaginas. Each of these topics has been the subject of documentary plays, a genre of theater that is similar to that of the documentary film. Documentary theater pieces are created by taking interviews, diaries, and journal entries and crafting a theatrical piece to look at a subject from many different sides. By using the real words, gestures, and thoughts of people involved, documentary playwrights strive to artistically and faithfully represent the experiences of those who helped to create the play. We will discuss different tactics used by playwrights in creating their documentary plays, how their choices affected the presentation of their subjects, and the choices made in the creation of the documentary theater piece *Women Who Will, People Who Do* which focuses on the community and culture of Wellesley College.

#### 2013’s “Must Have”: Racial Appropriation by Female Vocalists

*Jessica L. Osman, Senior Davis Scholar, Women’s & Gender Studies*

ADVISOR: *Elena Creef, Women’s & Gender Studies*

What do Katy Perry, Miley Cyrus, Lady Gaga, and Selena Gomez have in common? They are all female vocalists that were guilty of racial and cultural appropriation in 2013. These artists tried to show their “appreciation” of cultures by exploiting them for their own benefit during performances and ignored public outcries calling out their transgressions. Music industry insiders and even fans themselves try to say people are being “too sensitive” and that no harm is intended by the performances. This presentation will examine some of 2013 worst offenders and their performances. I will also discuss examples of popular non-American music artists who also showcased cultures different to their own and compare them to the American artists.

#### 21st Century Orientals: The Displacement of Eastern Identities in the Contemporary Hollywood Adaptation

*Annie Wang '14, Art History and Cinema & Media Studies*

ADVISOR: *Elena Creef, Women’s & Gender Studies*

In an increasingly globalized world, contemporary Hollywood has capitalized on sustained interest in Eastern cultures in the West by adapting several popular novels and television shows into big budget, feature-length films with all-star casts headed by some of the world’s most acclaimed directors. However, such adaptations have historically been mired in racially-charged stereotypes that displace and absent Asian bodies and voices from popular visual media in America. This thesis examines recent blockbusters such as *Memoirs of a Geisha* (2005, Rob Marshall), *The Last Airbender* (2010, M. Night Shyamalan), and *Cloud Atlas* (2012, Andy and Lana Wachowski; Tom Tykwer) through the lenses of post-structuralism, feminist theory, and critical race theory, and looks at the ways in which a film adapted from an Eastern-centric source strengthens, reacts to, or criticizes mainstream portrayals of “the Orient” with the endgoal of contextualizing the roles of Asian Americans in our supposed post-racial society.

## I Thought You Were My Friend

(short talks) Pendleton Hall East 139

### Children's Use of Iconic Gestures During the Preschool Years

*Felicia M. Brown '14, Psychology, Jenny Chen '16, Psychology*

ADVISOR: *Jennie Pyers, Psychology*

Two categories of iconic gestures predominate in early development, namely handling and object gestures. Whereas handling gestures convey how an object is held, object gestures involve physically representing an object with the hand. Because of a discrepancy in the literature, we wanted to see if asking children to talk or pretend with their hands had any effect on the types of gestures they produced. After testing over 100 preschool aged children, we found a developmental trend away from object gestures and towards handling gestures, regardless of condition. In a follow up study, we investigated the extent to which noun usage within the instructions impacts children's gesture production. Since we initially asked the children to show us actions (e.g. brushing teeth) with their hands, we wondered if phrasing the action as a noun (e.g. show me toothbrush) would elicit a different type of gesture.

### Real and Imaginary Social Relationships: Imagined Interactions and Attachment Styles

*Janet W. Jeong '14, Psychology*

ADVISOR: *Tracy Gleason, Psychology*

Imagined interactions (IIs) are a form of intrapersonal communication in which individuals recreate prior social encounters in their minds as well as rehearse for anticipated encounters. For example, before a job interview, you might rehearse your presentation in your head. Individual differences in IIs have emerged in terms of variables such as frequency, variety, and specificity. One factor that might influence the kinds of IIs in which an individual engages is attachment style. Attachment styles describe the quality of peoples' orientation towards relationships with others. My research question investigates whether attachment styles and the various facets of IIs are correlated. I hypothesize that a person who is preoccupied by their relationships with others might engage in a higher frequency of IIs than someone with a secure attachment style. On the other hand, attachment style and specificity of IIs are not expected to relate to one another. The results of this study will provide new insights into the ways in which imagination and mental processes link to real social relationships.

### Preschool Peer Pairs: Are We Friends or Are We Playmates?

*Talia S. Schwartz '14, Psychology*

ADVISOR: *Tracy Gleason, Psychology*

Early peer relationships and interactions are crucial for socio-emotional development. Yet not all peer relationships are the same; some dyads have strong and supportive characteristics and constitute true friendships, whereas other pairs are playmates, providing companionship but little intimacy. I was interested in the extent to which children distinguish between friends and playmates. In addition, many peer relationships in preschool are unilateral, meaning that one child recognizes another as a friend, but that recognition is not reciprocated. These unilateral relationships may be understood by children as playmates. I looked at whether preschool children understood the differences in peer relationships using a story that featured characters that had a range of relationship levels with the protagonist. Subsequently, children were interviewed about relationships with real peers. I hypothesized that children would distinguish between playmates and friends, that real friends would be associated with emotional support, and that playmates would provide companionship more than non-friends.

### Wellesley Centers for Women Student Research Interns

(panel discussion) Jewett Arts Center 450

*Gabriella M. Andriulli '14, French and Women's & Gender Studies, Bernice Y. Chan '16, Individual-Ethnic Studies, Nikita U. Saladi '16, Neuroscience, Prioty F. Sarwar '16, Biological Chemistry*

ADVISOR: *Layli Maparyan, Wellesley Centers for Women*

We are four student research interns from the Wellesley Centers for Women (WCW), each conducting individual research with a research scientist from WCW.

**Bernice Chan** (Shirley R. Sherr Student Research Intern) is working on the Media & Identity Project, a nationwide research study headed by Linda Charmaraman focused on how media use affects youth identity development and their psychological well-being, particularly for women of color. Bernice will present the preliminary findings on TV media representations (or lack of) and its influence on young women of color, highlighting the qualitative interview data.

**Gabriella Andriulli** (Linda Coyne Lloyd Research Intern) is conducting research on middle school and high school aged children and teens on the topic of sexual harassment

and assault. She is working on an article with Nan Stein, on an examination of the highly gendered aspects of sexual assault and how harassment/assaults are responded to in both the media in the legal system (if at all).

**Nikita Saladi** (Class of '67 Intern) will be speaking about how the PATH study and the CATCH-IT intervention program is preventing adolescents with depression and identifying adolescents that conventionally not be identified. She will also speak about how depression prevention is being increasingly prioritized with the implementation of the Affordable Care Act.

**Prioty Sarwar** (Morse fellow) will present her research on adolescent development and sexual health in middle schools. She focuses on the dynamics of family communication especially on a dyad between a teen and their parent/guardian and what ultimately leads to effective communication between these dyads regarding sex and relationships.

### Design for Affordability: Engineering Social Justice

(panel discussion) Pendleton Hall West 116

*Zak Barry '14, Technology, Entrepreneurship and Design (Babson), Annie Buchenan '14, Mechanical Engineering (Olin), Ian T. Daniher '14, Electrical Engineering (Olin), Sophia M. Garcia '15, Environmental Studies, Dante Santos '14, Mechanical Engineering (Olin), Janna M. Zimmermann '14, Environmental Studies*

ADVISOR: *Monica Higgins, Environmental Studies*

Did you know that 11% of Massachusetts residents are at risk for not getting consistent access to ample safe and nutritious food? This problem of food insecurity has had many solutions suggested for it, including bolstering the local food supply through supporting small and urban farms. Serving Ourselves Farm (under Boston Department of Public Health) is one of these; located on an island in the Boston Harbor, this farm provides most of its 25K pounds of produce per year to homeless shelters, rehabilitation centers, and post-incarceration job training programs. The New England weather makes for a very short growing season already and when the farm loses 90% of its seedlings, like last spring, as a result of mold from an unregulated growing environment, their yield is further limited. The farm budget does not allow for the purchase of a \$1000+ climate control system to solve this problem.

Our team's year-long mission, working with Olin College's Affordable Design and Entrepreneurship class and Serving Ourselves,

is to develop an affordable climate control system that will allow small farms to monitor and adjust their growing environments using pre-existing heaters, lights, and watering systems, thereby addressing the problems of control and price for our client. Come hear our challenges, triumphs, and discoveries as we conduct our first round of on-site, real-time testing, and gain a new perspective on the role of engineering and technology in the fight for just and stable social change.

**“Non-Queer” Matters: Queer Inventions and Social Justice**  
(panel discussion) Pendleton Hall West 117

**Sinvergüenzas sin documentos: “Undocuqueer” & Homonationalism**

*A. Bello '14, Individual-Peace & Justice Studies*  
ADVISOR: *Sima Shakhshari, Women's & Gender Studies*

Organizing in a temporality where the racialized and gendered immigrant is conceived as criminal, undocuqueers are building a critique of the state through their construction of political subjectivity that contends the complacency and complicit language of the mainstream immigration movement, evident in the work of the DREAMers, who present themselves as exemplary of neoliberal democratic ethics and citizenry. Through an exploration of the “Undocumented and Unafraid” campaign launched in May 2010, via the DREAM Act 5 Letters to Obama and the testimonios captured in Julio Salgado’s “I am undocuqueer,” Sinvergüenzas sin documentos contextualizes these “coming out” testimonios in contention with what Jaspar Puar would ascribe “homonationalism.” The undocuqueer movement radicalizes discourses around immigration reform by calling to question the criminalization of the immigrant and challenging the very basis of citizenry and borders that legitimize a racialized, militarized, and carceral society, through testimonio.

**The Biopolitics of Imprisonment: Insisting on Life, Abolishing the Prison Industrial Complex**

*Gabriella M. Fee '15, Political Science*  
ADVISOR: *Sima Shakhshari, Women's & Gender Studies*

This talk examines the myriad injustices that the Prison Industrial Complex inflicts upon queered and racialized bodies. It applies a Foucauldian theoretical approach to understanding the role of bio- and necropolitical control in strengthening the Prison Industrial Complex. Finally, it takes

up the call to abolition by envisioning a future beyond incarceration, while critiquing the Abolitionist Movement’s silence on the question of how communities ought to respond to violent harm. This paper concludes that as long as entire populations are consigned to death in the name of corporate profit and racism is entrenched in the very foundations of the American legal system, prison abolition must be at the forefront of all broader movements for social justice.

**Commenting in Control Societies: Chelsea Manning and Online Media**

*Allyson L. Pyers '15, Political Science and Women's & Gender Studies*

ADVISOR: *Sima Shakhshari, Women's & Gender Studies*

Former PFC Chelsea Manning was the subject of controversy and debate after releasing classified documents to WikiLeaks in 2010. After coming out as transgender following her sentencing for violation of the Espionage Act, Manning sparked conversations about national normative sexuality as it relates to security and terrorism. These discourses were particularly present in online comments, where users can rearticulate and recode norms and discourses conveyed in articles without the external editing and revision of formally published work. In this project, I analyze comments on online articles addressing Manning in order to explore the ways in which online commenters decode and recode discourses of normative sexualities, normative bodies, and national security in disciplinary and control societies.

**“Never Meant to Survive”:  
Necropolitics, Civilizational Discourse,  
and Mass Incarceration in Liberal  
LGBT Justice Projects**

*Heron E. Russell '14, Individual-Peace & Justice Studies*

ADVISOR: *Sima Shakhshari, Women's & Gender Studies*

Mainstream contemporary LGBT politics center upon promoting liberal principles of tolerance, legal rights, and equality, through projects such as marriage equality, military inclusion, and hate crimes legislation. By recapitulating these liberal ideological frames, building upon democratic visions of progress while enforcing regimes of individualism and the primacy of property, the mainstream LGBT movement fails to challenge and is thus fundamentally complicit in the maintenance of the racialized, classed, gendered, and heterosexed system of mass incarceration. The civilizational discourse inscribed in narratives of democracy and modernity, upon which mainstream LGBT politics are founded,

relies upon techniques of normalization that make increasing rights for certain historically marginalized groups and increasing exclusion, domination, and violence for others embedded and coterminous conditions. Through the constitution of biopolitical and necropolitical subject populations, the system of mass incarceration is fundamental to the ascendancy of the mainstream LGBT movement as a liberal civilizational project.

**To Educate a Nation: Students Advocating Greater Access to Education for Congolese Women**

(film screening) Collins Cinema

*Hanna G. Tenerowicz '16, Comparative Literature and Art History*

ADVISOR: *Flavia Laviosa, Italian Studies*

Sandra Bea is the founder of the Muanjadi Organization, which provides scholarships to promising young students whose families can no longer afford their \$75-a-year tuition at the Muanjadi High School, an all-female institution in Mbuji-Mayi, Democratic Republic of Congo.

Gracia, Carine, and Serha are three inspired Muanjadi scholars passionate about school and dedicated to advocating women’s rights and education. I created a documentary, To Educate a Nation, to give them a vehicle through which to share their narratives in support of greater access to education for Congolese women with a wider audience. The film also seeks to honor the growth of Sandra’s organization from its start as an inkling in the mind of a young Congolese emigrant to its status today, five years after its establishment, as a source of hope not only for Muanjadi’s students, but for the entire Mbuji-Mayi community.

## Humanities

**Liberty, Equality, Identity**

(short talks) Pendleton Hall West 117

**The Legacy of Colonization in France: History, Memory and Republican Values***Oluwakemi L. Akin-Olugbade '14, Psychology and French*ADVISOR: *Venita Datta, French*

On February 23, 2005, the French parliament passed a law to acknowledge repatriates of former French colonies and express gratitude for their contribution to French colonial "exploits." The legislation relates to the  *Pieds Noirs*, Europeans who lived in North Africa during French colonial rule in the region, and the  *harkis*, Algerian soldiers who served in the French army during the Algerian independence war. Lawmakers also encouraged the French to engage in a more "positive" discourse on the effects of colonization and advocated the creation of elementary school curricula emphasizing its "positive aspects." The law was highly controversial in France and in its former colonies, particularly in Martinique and Algeria, and a number of historians, philosophers and political figures condemned it. Nonetheless, polls indicated that 65% of the French public was favorable to the teaching of the "positive aspects" of colonization in history classes.

**Defenders of French Republican Ideals?: Violence's Impact on the Identity of Anti-Colonialist Intellectuals During the Algerian War***Sophia Mo '14, French and International Relations-Economics*ADVISOR: *Venita Datta, French*

By the end of the nineteenth century, the term "intellectual" was born in France and gradually became an established category referring to engaged thinkers who spoke on behalf of the nation in the name of French Republican values celebrated as universal to mankind. Yet the escalating violence and use of torture on both sides during the Algerian War (1954-1962) for independence from French colonial rule forced intellectuals to doubt their ability to fulfill this role. Not only did the war deeply divide the intellectual left, exposing its lack of a coherent anti-colonial message, but it also challenged each intellectual's notions of what it meant to be an intellectual. In particular, the wartime writings of Jean-Paul Sartre, Albert Camus, and Frantz Fanon highlight the anti-colonialist intellectuals' collective ambivalence toward the traditional role of the intellectual as the embodiment and

voice of universal ideals. (Research supported by Nathalie Buchet and Schiff Fellowships)

**Changing Spatial Discourses of National Identity in Jordan***Laura W. Yan '14, History and Middle Eastern Studies*ADVISOR: *Lidwien Kapteijns, History*

When Jordan was created as a British mandate in 1923, it was a state but not yet a nation. In order to be seen as legitimate rulers of a 'natural' national community, the Hashemite monarchy intertwined discourses of national identity and legitimacy in the changing contexts of Arab-Israeli conflicts, radical pan-Arab nationalism, and political Islam. The Jordanian government expressed these discourses by making claims to holy spaces in Jerusalem and (re)constructing various monuments, museums, plazas, and parks in the capital of Amman. However, competing visions of the Jordanian nation also emerged, ranging from nationalist movements that were exclusively Transjordanian to those that identified as Arab nationalist and opposed to the monarchy. The struggle to create a unified Jordanian national identity has expressed itself in public spaces as different political and social groups articulated their own versions of what the Jordanian nation should be. (Research supported by a Schwarz Fellowship)

**Influences of Late Beethoven Piano Sonatas on Schumann's Solo Piano Work: Incorporation of Beethovenian Elements in Schumann's Phantasie in C**

(short performance)

Jewett Arts Center Auditorium

*Michiko O. Inouye '14, Music*ADVISOR: *Charles Fisk, Music*

Schumann's  *Phantasie Op. 17* was initially intended to raise funds for a Beethoven monument in Bonn. It is therefore reasonable to assume that this piece would draw inspiration from Beethoven's distinctive compositional style. Although certain conclusions have been drawn regarding Schumann's references to Beethoven's music in the  *Phantasie*, in particular the quotation of the final song in Beethoven's song cycle,  *An die ferne Geliebte*, closer musical parallels in harmony, key relationships and textural choices between  *Phantasie* and specific Beethoven works have yet to be demonstrated. I hope to explore the Beethovenian musical characteristics adopted in the  *Phantasie* by Schumann through close comparison of this work with Beethoven's late sonatas Op. 109, 110 and 111. These analyses can aid not only in identifying the specific characteristics of Beethoven's music from

which Schumann drew inspiration, but also in understanding the ways in which he remodeled these elements creatively.

**Les Nuits D'été: Summer Nights with Berlioz, Piano and Orchestra**

(short performance)

Jewett Arts Center Auditorium

*Katherine A. Siegel '14, Music*ADVISOR: *Gurminder Bhogal, Music*

Berlioz composed the song cycle  *Les Nuits D'été* in 1840-41 for voice and piano, and orchestrated the work fifteen years later. In the centuries following his death, the masterful orchestration of this later publication sent the initially admired piano version into obscurity and propelled the orchestral version into the limelight. The later version boasts all the riches of the orchestra, but what of the original version, composed as Berlioz originally intended the music to be heard? Although it is less admired today, the intimate piano-voice version reflects the special partnership between singer and pianist that Berlioz originally envisioned for the songs. In this lecture demonstration I will discuss the unique aspects of each version and perform excerpts accompanied on piano by David Collins. (Research supported by Jerome A. Schiff Fellowship.)

**Studies, in Various Media, of the Human Skeleton**

(exhibition) Jewett Arts Center Art Gallery

*Anna A. Blige '16, Philosophy and French Cultural Studies, Lauren A. Bocknek '15, Undeclared, Orli C. Hakanoglu '16; Architecture, Catherine S. Harlow '15, Art Studio and Art History, Helena N. Maurer '17, Undeclared, Jayne Yan '16, Undeclared*

ADVISOR: *Bunny Harvey, Art*

Students in Life Drawing, ARTS217, spend 6 weeks looking at, studying and responding to the human skeleton. These homework assignments supplement the semester-long classroom study of living models. Exploration, and experimentation with various media and drawing techniques are encouraged.

**Quilombolas**

(film screening) Collins Cinema

*Maria C. Fernandes, Senior Davis Scholar, Environmental Studies*ADVISOR: *Winifred Wood, Writing Program*

Brazil is experiencing a historic moment of rapid development and urbanization accompanied by the desire to protect rapidly vanishing natural environment. My film project bears witness to

the ongoing transformation faced by one of Brazil's protected populations, the Quilombolas (descendants of Afro-Brazilian slaves), as they confront the clash between environmental legislation and the traditions of their agrarian society. My documentary film registers their reactions and records their way of life. I aim not only to tell the Quilombolas' story, but to reveal the tension that exists on the axis of environmental protection and human rights. As I enter the Quilombolas' circle to share what is essential to them, I also aim to illuminate the interests of the management of the National Park of Chapada Diamantina as they attempt to understand the complexities of these territories. I extend my gratitude to the Quilombolas, who responded in a dignified and graceful manner to my proposal.

## Science & Technology

### Controlling the Human Body (short talks) Pendleton Hall East 139

#### Exploring the Mechanism of Ovarian Steroid Hormone Action in the Brain

*Sarah D. Finkelstein '14, Neuroscience,  
Hande C. Piristine '14, Neuroscience*

ADVISOR: *Marc Tetel, Neuroscience*

The ovarian steroid hormones, estradiol (E) and progesterone (P), act in brain to regulate female reproductive behavior and physiology. E and P elicit these effects by binding to their respective intracellular receptors, which are transcription factors. There are two forms of progestin receptors (PR): the full-length PR-B and the shorter PR-A. These PR isoforms have distinct roles in rodent reproductive behavior and physiology. However, how one isoform is selectively expressed is not known. Two steroid receptor coactivators (SRC-1 and SRC-2) facilitate the expression of PR. Using genetically engineered mice that express only PR-A or only PR-B, we investigated the function of these SRCs in the expression of the specific PR isoforms in brain. We also looked at how SRCs from brain interact with different PR isoforms with pulldown assays. Our results will further elucidate mechanisms of PR action and function in the brain.

#### Management of High-Risk Cutaneous Squamous Cell Carcinoma

*Victoria M. Hills '14, History and  
Biological Sciences*

ADVISOR: *Heather Mattila, Biological Sciences*

About 700,000 cases of cutaneous squamous cell carcinoma (CSCC), a type of skin cancer, are diagnosed annually in the U.S. Most of these cases are highly curable, but some tumors

are high risk and can recur (5% of cases), metastasize (4% of cases), or cause death (1.5% of cases). Although treatments for melanoma, a skin cancer that has higher rates of recurrence, metastasis, and death, are highly standardized, there are no precise nationwide guidelines in place for treating high-risk CSCC. However, it is estimated that CSCC and melanoma cause a similar number of deaths each year, which suggests a need for better characterization and evaluation of current CSCC treatments. For my senior thesis project in the biological sciences, I evaluated the treatment of 136 high-risk CSCC tumors that were diagnosed between 2000 and 2013 at Boston's Brigham and Women Hospital, with the goal of characterizing recent treatment strategies for high-risk CSCC and evaluating treatment efficacy. (Research supported by a Schiff Fellowship.)

#### Neural Correlates of Attention for Correct Response Production and Inhibition

*Allyn V. Morris '14, Neuroscience*

ADVISOR: *Michael Wiest, Neuroscience*

In order to investigate the neural basis of response production and response inhibition, rats were trained with a Go/No-Go task. In this task rats lick in response to target tones to receive a water reward and refrain from producing a motor response on distractor tones. Implanted microelectrodes in the medio-dorsal frontal and posterior parietal cortices were used to record local field potentials (LFPs), and frontal-parietal coherence was calculated for each trial. Coherence analysis is used to measure the degree of synchronization between neural signals in order to determine if the areas of the brain are communicating or working with each other. High levels of theta (4-7 Hz) and alpha (8-13 Hz) coherence between frontal and parietal were seen in both Go and No-Go trials. Coherence data collection is still underway, but our preliminary results suggest that greater coherence at low frequencies is associated with the act of licking and not necessarily correctly responding. Overall, these results help us to better understand attentional processing in the rat, as well as its correspondence to human attentional processing.

#### Synthetic Polymeric Nanoparticle Vaccines for Immunostimulation

*Zoe E. Moyer '15, Biological Chemistry*

ADVISOR: *Robert S. Langer, Biological Engineering (MIT)*

While routine vaccination has helped raise juvenile life expectancy and eradicate diseases, vaccine delivery systems have not capitalized

on our current understanding of the adaptive immune response. Recently identified toll-like receptors (TLRs) provide promising targets for novel vaccine delivery; however, free adjuvant can trigger systemic toxicity. We hypothesize that nanoparticles engineered to deliver a TLR agonist and antigen in a controlled-release manner to antigen-presenting cells (APC) can utilize TLR targets for immunostimulation at a reduced risk. Our vaccines augment antigen presentation and co-stimulatory DC molecule production for model protein ovalbumin and mount an antigen-specific CD8+ naïve cell-proliferation in vitro. In vivo, our vaccines increase the antigen-specific adaptive immune response for both the cell-mediated and humoral branches. Our findings demonstrate clinical potential for safe delivery of novel TLR adjuvants and polymeric nanoparticles towards the development of effective and low-cost vaccines.

#### A New Approach to Medical Treatment: Building Novel Drug-Delivery Systems

(panel discussion) Founders Hall 126

*Young-Ah Lee '14, Chemistry,*

*Yuka I. Milton '14, Biological Chemistry and  
Sara N. Musetti '15, Biological Chemistry*

ADVISOR: *Nolan Flynn, Chemistry*

Current therapies lack the specificity and efficacy to treat diseases posing significant limitations for patients. We aim to engineer two novel devices that serve as drug-delivery vehicles with the potential to improve treatment options for late-stage pancreatic cancer and diseases that are currently attributed to medication non-adherence. One project, a collaborative effort, is creating a nano-vehicle composed of an iron-oxide core coated with a gold shell that provides targeted damage to cancer cells while being tracked in vivo with magnetic resonance imaging. Functionalization of the gold shell relies upon a biomolecular system anchored to the nano-vehicle through "stealth" polymer linkers which also add stability to the nanovehicle. A second biomolecule that targets a cell surface receptor expressed by many pancreatic tumors, and the therapeutic agent for boron-neutron capture therapy are also attached to the gold shell through other species. The second project is developing a Janus device that has unique capacity for extended gastrointestinal retention and release with an omniphobic side and a mucosal adhesive side. Respectively, this dual layer will enable repulsion of the food stream and allow attachment to the wall of the gastrointestinal tract. (Research supported by a Jerome A. Schiff Fellowship, NIH, and Stanley Fund for Cancer Research)

### Pushing the Limit: Localizing the Source of Neuronal Stem Cells Responsible for Adult Neurogenesis

(panel discussion) Founders Hall 120

Emily L. Cockey '15, Neuroscience, Kristina A. Costa, Senior Davis Scholar, Neuroscience, Jingjing Li '15, Neuroscience, Jody F. Platto Senior Davis Scholar, Neuroscience

ADVISOR: Barbara Beltz, Neuroscience

Adult neurogenesis - the birth of new neurons in the adult brain - is common in both vertebrates and invertebrates. Investigations in mammalian models suggest that stem cells involved in adult neurogenesis are self-renewing and produce lineages of neuronal precursor cells. Previous investigations in the crayfish, *Procambarus clarkii*, have found that although the pool of first-generation neuronal precursors in the neurogenic niche is never depleted, these cells are NOT self-renewing. Therefore, there must be a source extrinsic to the niche. Our evidence suggests the innate immune system as a likely source. Current projects focus on elucidating the relationship between the immune system and the lineage of cells producing adult-born neurons, and the possible modulation by serotonin through the cytokine astakine.

### Illuminating the Invisible Universe

(panel discussion) Pendleton Hall West 116

Gillian D. Beltz-Mohrmann '16, Astrophysics, Kirsten N. Blancato '15, Astrophysics, Hikari Murayama '16, Undeclared, Lucia A. Perez '14, Astrophysics, Camille C. Samulski '16, Undeclared

ADVISOR: James Battat, Physics

As you read this abstract, millions of cosmic particles go undetected as they stream through your body. Some, like the muon, are well-understood, while others, like dark matter, are more mysterious. Muons are similar to electrons, only more massive and unstable (they decay in a few microseconds). We are building a detector sensitive to the lifetime and flux of muons. By comparing the flux of muons at high elevations to that at sea level, we will demonstrate two of the strange consequences of Special Relativity: that a moving object shrinks and a moving clock ticks slowly. We will also describe the effort at Wellesley to search for the signature of WIMP dark matter particles in the Milky Way galaxy. Although the presence of dark matter in the halo of our galaxy has been inferred from its gravitational effects on ordinary matter, WIMPs have not yet been detected directly. Our experiment aims to take advantage of the directional modulation of WIMP arrival direction as the Earth travels through the galaxy.

### Like Magic: Novel Human-Computer Interactions

(short talk and interactive teaching presentation) Science Center E125

### Haptic Interaction Using 3D Stereoscopic Display Technology

Heather H. Petrow, Senior Davis Scholar, Media Arts and Sciences

ADVISOR: Orit Shaer, Computer Science

Haptic feedback is an area of technology that utilizes the sense of touch, by providing tactile interaction. It has been integrated into gaming consoles and mobile devices, and has been researched for its potential in programs that range from medical training simulations to collaborative workspaces. 3D is another growing facet of technology that is reexamining the possibilities of the user experience. The zSpace platform is the first-generation of computing hardware that simulates realistic, holographic, 3D, stereoscopic vision. Using this system, this research project aimed to study how haptic feedback can enhance the user interface and understanding of 3D virtual space, by applying and exploring the effects of different types of haptic interaction in two zSpace applications. Evaluation included a comparative analysis of user ability in haptic and non-haptic versions of the programs, for problem-solving, spatial reasoning, and recognition of physics and materiality in the virtual environment.

### Finding Magic in Tangible Interactions with Everyday Objects

Annie L. Han '14, Media Arts and Sciences, Yu Mei Lay He '14, Economics, Stephanie Lee '14, Computer Science

ADVISOR: Orit Shaer, Computer Science

Nowadays, children use computers for everything. However, research shows that children often learn best when they are physically engaged. Body movements, the ability to touch, manipulate, and build sensory awareness of relationships in the physical world are crucial to development. When a child is given a new toy with many unique functions and features, they are often more fascinated by the cardboard box it came in. With that observation, we present Magicbox, the concept of a modular toy kit that enhances the experience of playing with cardboard boxes. Magicbox combines elements of simple circuitry and electronics to augment creative possibilities for children to make playful environments with any cardboard box. By abstracting circuitry to boxes, we allow children to explore the systems without knowing exactly what to expect. This lends to learning by experimenting and could develop exploratory learning skills. We wish to present three proto-

types that utilize sensors, microcontrollers, and creative uses of conductive material to explore the Magicbox concept. <http://magicbox2013.wordpress.com/>

## Social Sciences

### How You See Me, How I See Me

(short talks) Pendleton Hall East 339

### Asian Representations in American Advertising

Vivian Y. Dai '14, Psychology and American Studies

ADVISOR: Markella Rutherford, Sociology

In recent years, reports of increasing Asian-American buying power and consumption have sparked companies' interest in and targeting of Asian American consumers. To understand representations of Asian people and objects in American advertising today, hundreds of print advertisements from 15 top-circulating magazine titles of the past three years are categorized and examined, with attention to factors including gender and industry, as well as positioning of models and other elements within the images. This project explores advertising's portrayals of Asian Americans, how they compare and connect to research done in the past couple of decades and to filmic representations, and the advertisements' resulting social messages in an age when Asianness is increasingly associated with financial success and the ultramodern. (Research supported by a Student Multicultural Research Grant)

### Go Ask Your Mother: Self-Perceptions of Working Mothers in a Gendered World

Kelsey N. Heroux '14, Sociology

ADVISOR: Smitha Radhakrishnan, Sociology

While scholarship on women in the workforce is abundant, women's perspectives of their own lives are not adequately represented. This study aims to fill that gap and utilizes data from interviews conducted with working mothers who come from a variety of education and career backgrounds. The main themes of the research include self-perceptions in gendered work environments, expectations of motherhood, and the possibility of being both career professionals and mothers. Analysis of the data reveals that women commonly downplay their femininity in an attempt to blend in with their male colleagues, while some purposefully work to assert the value of their feminine qualities. Most women reject the popular definition of "having it all" and instead offer alternative interpretations that indicate that all women do not want to be

a perfect housewife with a high-powered career. (Research supported by the Office of the Provost and Dean of the College Research Grant)

### **Stereotyping and Threatening Men: How Race Affects Stereotypes and Communal Priming Affects Self-Perceived Masculinity**

*Kayla N. Northrop '14, Psychology, Emily A. Sperbeck '14, Psychology, Guangxin Wang '14, Psychology and Individual-Peace & Justice Studies*

ADVISOR: *Linda Carli, Psychology*

Men are seen as dominant, competent, but not communal—but does racial identity affect these stereotypes? The interaction of race and gender has not been widely researched. In our first study, we explored American's beliefs about whether men of various ethnic groups are perceived to be agentic, dominant and communal, as well as how they ought to rate on these traits. In our second study, we focused on stereotype threat—priming male participants with depictions of men of different ethnicities doing traditionally feminine actions, such as parenting. We examined how men would react to threats to male masculinity, and whether this effect was moderated by the race of the male depicted in the primer. Stereotype threat has been widely studied in females and minority groups, but there is little research on stereotype threat of men. These two studies provide important insight on the intersections of racial and gender stereotypes.

### **Conscription and Gender Regimes in the Republic of Korea: Through Reality TV Show “Real Manly Man”**

*Claire Yi '15, Individual-Peace & Justice Studies*

ADVISOR: *Catia Confortini, Peace Studies*

The Republic of Korea's geopolitical conditions including the divide of the peninsula and the ongoing disputes with the neighboring nations have led to the tight control over the citizens throughout the history. This paper argues that such control extends, in the form of conscription, to both those forced to serve in the military (healthy men) and those not subject to this constitutional duty (women and disqualified men). In doing so, this paper analyzes the recent military reality TV show ‘Real Manly Man’ in order to examine how hegemonic gender regimes are constructed and maintained in military borders and in reality TV show settings.

### **Separate and Unequal** (short talks) Pendleton Hall East 239

#### **Social and Economic Disparities as Context for Poor Health in the Latina Community**

*Rachel A. Fletcher-Slater '16, Spanish*  
ADVISOR: *Nancy Marshall, Wellesley Centers for Women*

There is a growing recognition of the importance of understanding health disparities among different communities. As a result of the rise in medical statistics available for the Latina community, a certain pattern emerges among Latina women. While Latinas are less likely to be diagnosed with breast cancer than other women, they are more likely to die from it. This same pattern has been found in other illnesses. Research suggests gaps in communication between health care providers and the Latina community, as well as limited accessibility to health care as a function of economic inequalities.

#### **Women and Public Health in Iran: A Historical Perspective**

*Roxana Mir '15, Neuroscience and Women's & Gender Studies*

ADVISOR: *Sima Shakhshari, Women's & Gender Studies*

This study aims to provide a preliminary overview of the state of women and public health in Iran within the framework of Persian medical history and culture. Like all the peoples of antiquity, the old Iranians shared a belief in the supernatural causes of sickness. But at the same time, they also believed that for every ailment there is a cure and that there are plants and trees in nature whose properties can be used to cure disease and to restore health. They further recognized from the earliest times that health conditions can be the result of physical and natural causes, as well as, temperaments, habits and old age. The study explores the historically evolved relationship between health care, medicine and public health in Iran while focusing is on those society-wide practices, beliefs and conditions, including social divisions and inequalities, that impacted the state of public health and women's wellbeing in the Iranian society.

#### **Income Inequality and Infant Mortality in the United States**

*Helen M. Willis '14, Economics*

ADVISOR: *Phillip Levine, Economics*

Both infant mortality and income inequality in the United States are substantially higher than in other developed countries. Within the U.S., there is a great deal of variation by state in infant

mortality rates, and states with higher infant mortality rates are more likely to have high income inequality as well. I use infant birth and death certificate data from the U.S. to explore whether income inequality has a causal effect on infant mortality, or if the relationship between the two occurs instead because of other state characteristics correlated with both variables. (Research supported by a Schiff Fellowship)

#### **Health Insurance Coverage and Consumer Finances**

*Wendy Wu '14, Economics and Mathematics*  
ADVISOR: *Courtney Coile, Economics*

Young adults have the lowest rates of health insurance, which exposes them to significant financial risk from negative medical shocks. Starting in the 1990s, states sought to address this issue by passing laws allowing adult children to remain on their parents' health insurance, and in 2010 the Affordable Care Act extended this coverage nationwide to dependents through age 26.

Recent evidence suggests these laws have increased the insurance rate among young adults. However, did this increase in coverage lead to an increase in financial security? We analyze this question using data from the Commonwealth Fund Health Insurance Surveys and multiple measures of financial health, including debt and personal bankruptcy.

#### **Spreading the Wealth** (short talks) Pendleton Hall West 212

#### **The Effects of Fiscal Stimulus: Evidence from China's 2007-2013 “Appliances to the Countryside” Program**

*Michelle S. Lam '14, Economics and Mathematics*

ADVISORS: *Akila Weerapana, Economics*

The 2008 financial crisis sent shock waves throughout the world and spurred incredible reactions, one of which was China's \$4 trillion RMB stimulus. In addition to stimulating the economy in the short run, the package also aimed to increase living standards of those in rural areas and to jumpstart a culture of consumption. Starting with pilots run in 2007, the Chinese government paid a 13% subsidy to rural households who purchased qualifying domestically-produced household electric appliances. This program, “Appliances to the Countryside”, was eventually implemented nationwide in 2009. My research seeks to evaluate the impact of this program and its effect on purchases of home electric appliances and other outcomes of interest.

### Adverse Selection in the Great Irish Tontines of 1773, 1775, and 1777

*Yikang Li '14, Mathematics and Economics*  
ADVISOR: *Casey Rothschild, Economics*

Adverse selection is an undesired market outcome that occurs when there is asymmetric information between the buyers and sellers. For example, in the insurance market, people who know they have a higher risk of claiming than the average of the group are more likely to buy the insurance, hence raising the premium of the product for all other policyholders.

My thesis studies the problem of adverse selection in the late 18th century British life annuity market, in particular, the “Irish tontine” issued in 1773, 1775 and 1777. Identifying and measuring adverse selection in today’s insurance market has been proven difficult given the market’s complexity. I hope to shed light on a challenging modern empirical question from a new perspective - economic history.

### A Decade Later: An Evaluation of the Longer-Term Impacts of a Honduran Conditional Cash Transfer

*Emma L. Rackstraw '14, International Relations-Economics*  
ADVISOR: *Patrick McEwan, Economics*

The simplicity of giving money to the poor for a specific and preapproved purpose appeals to many stakeholders in the field of development, from policymakers to economists. In education policy, conditional cash transfers have been found effective in improving school attendance/enrollment and short-term learning, as well as lowering child labor supply; however, the effects have only been studied after a relatively short time period after the transfer. The ultimate goal of investment in education is to get some return to that investment through an improvement in children’s long-term well-being. My thesis captures some of these longer-term effects (up to a decade later) for the recipients of the Honduran CCT program, PRAF. The results not only help answer questions about the effectiveness of PRAF in the context of Honduras, but will also begin to fill a substantial void in our knowledge of long-term poverty alleviation strategies.

### Bangalore: Urban Development and Design for the Underclass

*Mayrah W. Udvardi '14, Environmental Studies and Architecture*

ADVISOR: *James Turner, Environmental Studies*

Bangalore, a rapidly growing global city in Southern India, serves as a useful case study to examine the broader phenomenon of

environmental injustices in cities worldwide. Today, 8.4 million people crowd the city, 20% of whom are slum-dwellers who lack access to safe and affordable housing, clean water, latrines, transportation networks and employment opportunities. Bangalore’s urban development plan is neither equitable nor sustainable and it is leading to widespread environmental degradation and injustices. I am specifically interested in how conventional paradigms of the natural-built environment in an urban context establish environmental injustices in Bangalore. Using this framework to analyze the history of the city’s urban growth and current drivers of urban environmental degradation and inequality will provide a rich context for my study of Ejipura Slum, the most widely recognized and contentious site of environmental injustice in Bangalore. Studying urbanization and resulting environmental injustices in Bangalore can serve as a useful case study for other emerging economies and inform development decisions in cities worldwide.

### Bodies, Narratives, and Performativity

(panel discussion) Science Center 278

### Cuerpo y raíz: Diálogos of Urban Mestizaje, Performance, and Healing

*A. Bello '14, Peace & Justice Studies and Women's & Gender Studies*

ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

The body carries the *conocimiento*, a knowing and remembering, of the lived experiences of those that came before us. Border artists, such as *Las Mujeres de Maíz*, a *mujeres de color* artist collective, work to (re)member their bodies in reclaiming personal and public terrains. My interests and explorations as an artist lie in the use of cultural forms to make visible our bodies and surrounding social structures. Urban *mestizaje* is a living alterNative to re-envisioning Chicana and Latina histories in North America, which straddle the worlds of *nepantla*, a Nahuatl term connoting in between. I am interested in the ways urban *mestizaje* necessitates the use of art, especially performance, and *comunidad* to feed individual and communal processes of healing from the open wound of colonial and neoliberal occupation.

### Narratives of Illness and Healing

*Alexandra M. Grzywina '14, English*  
ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

In surveying narratives written by a diverse group of young U.S. women diagnosed with anorexia nervosa, my research project is an analysis of the themes and patterns that emerge at various stages of the illness. I begin by investigating how these women describe the contributing factors, the distortions they perceive in their thinking, and their realization of a disorder. I examine how the illness evolves: how it alters perceptions of mind and body, relationships with family and friends, and interactions with healthcare practitioners. I also inspect the triggers for relapse and what ultimately makes for a successful recovery. I further explore how this illness affects the women’s conceptualizations of gender, becomes part of their identities, and brings certain meanings into their lives. Finally, I look at why these stories are written down, and what they reflect about modern day U.S. society.

### Leaders, Listeners, and Learners: American Women Who Have ‘Shattered the Glass Ceiling’

*Leah Sams '14, Women's & Gender Studies and Public Policy*

ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

An analysis of twenty-two qualitative interviews comparing significant difference in experience and expectations of women in top academic administrative and corporate executive leadership positions works to exhibit just how women ‘shatter the glass ceiling’. Though personal and professional narratives determine reasons an individual might be tapped, personal narratives in the lives of corporate executives prove more indicative of an ultimate decision to take the position. In light of the impact of the intersection of gender, race, sexuality, and social class on one’s life story, demographics firmly demonstrate women of all backgrounds can make it to the top. As a majority of executives were raised in working to middle class households, these data seem illustrative of an important larger trend: Women leaders have managed to use factors traditionally working against them as motivation to propel themselves to the top. (Research supported by a WGST Department stipend.)

### **Wewepahtli: Health and Healing in Santa Ana, CA**

*Jannet G Sánchez '14, Women's & Gender Studies*

ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

In 2004, a Rockefeller Institute study named Santa Ana, CA the 'toughest place to live' in the United States. Santa Ana is home to unemployment, low education levels, crowded housing and poverty, and it is also a place I call home. With my interest in health and healing, I embarked on a quest to learn how Santa Ana residents envision and create health for themselves in the face of this adversity. My research explores Wewepahtli, the Great Medicine, the concept that everything is medicine: food, art, sound and includes therapies such as herbal medicine, talk therapy, and exercise. The use of ancestral knowledge of holistic and herbal medicine in community-based organizations is analyzed as a basis for achieving individual and community healing and health justice.

### **"Clothing the Pacific": An Introduction of the Post-Colonial Body in Samoa**

*Elizabeth Torres '14, Women's & Gender Studies*

ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

In the 21st century the implications of Christianity continue to influence roles of dress and appearance in Samoa. In Samoa, dress and appearance abide by many codes that are shaped and policed by religion, your economic standing, and the government. In this research contributing factors of dress and appearance ideals are highlighted and analyzed across a timeline, which helps explain why Samoans dress and appear the way they do now. For this study fieldwork was collected through surveys, observations, and personal interviews. In addition, the study draws from women and gender theories to explain the implications of patterns and influences on Samoan dress and appearance in the 21st century. Themes of colonialism, neocolonialism, the intersection of religion and gender highlight the ways in which the Samoan body has been colonized.

### **Postcards from the Border**

*Yesenia Trujillo '14, Women's & Gender Studies and Computer Science*

ADVISORS: *Irene Mata, Women's & Gender Studies and Jennifer Musto, Women's & Gender Studies*

"La frontera esta mas que sellada." "Ya no vale la pena." These are the phrases that stick with me as we are led out of the director's office into the patio where about 10 of the migrant men are sitting. Bienvenido a Tijuana. This past Wintersession, I worked with Professor Gabriella Sanchez from Monash University on her research on women who had recently crossed the US-MX border. While we were there, we visited two shelters: one for men who had recently been deported from the US and the other for women and their children who had recently attempted to cross the border or had recently been deported. In this presentation, I will share some of my experiences and photographs from Tijuana at an attempt to humanize a commonly demonized group of people.

### **So You Want to Invent a Language?**

(panel discussion) *Jewett Arts Center 450*

*Samantha G. Burke '14, Cognitive & Linguistic Sciences and German Studies, Shirin Maani '14, Cognitive & Linguistic Sciences, Joanna Poget '14, Cognitive & Linguistic Sciences, Morvareed E. Rezaian '14, Cognitive & Linguistic Sciences, Laura W. Rigge '14, Russian and Cognitive & Linguistic Sciences, Sarah E. Vaughn '15, Cognitive & Linguistic Sciences*

ADVISOR: *Angela Carpenter, Cognitive & Linguistic Sciences*

While invented languages have been around for centuries, they have become more visible in recent years through movies and television shows such as Avatar's Na'vi and Game of Thrones' Dothraki, along with video games and other media. What does it take to invent a linguistically-sound language? Members of LING 315 tackled that challenge with exciting results. Come along with us as we discuss the process, the problems and the end-result of building a language from the ground up. Each of us has a completely different language with its accompanying culture. We will share with you how we created the culture and built the sounds, the words and the syntax of our languages. We hope you will be inspired by the possibilities!

### **Perspectives from the Freedom Project III: A Misrepresented Political Minority: The Republican Party**

(panel discussion) *Science Center 396*

*Lizamaria Arias '17, Undeclared, Anna Page '17, Undeclared, Alexis Zhang '17, Undeclared*

ADVISOR: *Thomas Cushman, Sociology*

As Adam Smith Fellows of The Freedom Project, we have discussed the importance of liberty in human societies, particularly in terms of freedom of speech. While we are in agreement that being able to freely share one's views and ideas is important to a functioning democracy, what happens when this freedom results in a "tyranny of the majority"? This is what has happened in the media representation of the Republican Party. It has been misrepresented by the media, especially in the last two Presidential elections, and especially among American youth. We examine the ways in which the Republican Party has been misrepresented and the social stigmatization of those who consider themselves Republicans. The topics of the panel include: the Republican Party and the youth generation; media bias and its effects on audiences; and the effects of misrepresentation on minority voting patterns. Panelists will present strategies for countering negative stereotypes and strategies for increasing Republican Party participation youth, minorities and in the media.

## Humanities

**Calderwood Seminars in Public Writing: Engaging Interviews**

(panel discussion) Pendleton Hall East 139

*Alyssa J. Kayser-Hirsh '14, Music and American Studies, Nora E. Mishanec '14, Psychology, Jody F. Platto, Senior Davis Scholar, Neuroscience, Dania N. Wright '14, Biological Sciences and Anthropology*

ADVISOR: *David Lindauer, Economics*

**Alyssa Kayser-Hirsh:** Caroline Shaw may be a Pulitzer Prize and Grammy-winning composer, but more importantly she is an inspiring woman working in the field of new classical music. In addition to writing music, Caroline performs as a violinist with the American Contemporary Music Ensemble and as a vocalist with the cappella vocal octet Roomful of Teeth. After Roomful of Teeth's weeklong residency at Wellesley, I became interested in the field of new classical music and was fortunate to interview Caroline about her work and experience as an assignment for my Calderwood Seminar, Music in Public. My interview focused on women in classical music, the role of publicity in the arts, and the influence of musical education on subsequent musical pursuits.

**Nora Mishanec:** For my Calderwood Seminar, Psychology in the Public Interest, I conducted an interview with Dr. Stephenie Chaudoir, a professor at the College of the Holy Cross, who specializes in the psychology of concealable stigmatized identities. Dr. Chaudoir's research led her to develop a model for disclosure now used widely by HIV-positive patients. Additionally, she studies predictors of psychological and health well-being in HIV/AIDS patients. My interview with Dr. Chaudoir centered on the social justice element of her work, as well as the changing nature of HIV/AIDS research. We discussed her methods for collecting data, which require sensitivity and deference to the needs of the participants.

**Jody Platto:** Gina Maranto is the Director of the Leonard and Jayne Abess Center for Ecosystem Science and Policy at the University of Miami. She is the author of *Quest for Perfection: The Drive to Breed Better Human Beings* and has published widely on bioethics and reproductive medicine. I interviewed Maranto for my Calderwood Seminar in Law, Medicine and Ethics. Maranto gave an engaging interview that included discussion of her career path in science journalism and teaching, her interest in bioethics and reproductive technology, the process of writing *Quest for Perfection*, and the goals for her work.

**Dania Wright:** Most people would not compare bees to teddy bears. Heather Mattila is not most people. Mattila, an Assistant Professor of Biological Sciences at Wellesley College, focuses her research on organization in social insect colonies. She has studied how genetic diversity in honeybee colonies impacts on hive productivity. In my culminating interview project for the Calderwood Seminar, Biology in the News, I hoped to illuminate not only the science behind Mattila's work, but also the personal experiences that shaped her path as a scientist and continue to drive her research.

**Engagement in Nature: A Visual Exploration of Wellesley Botanic Gardens**  
(exhibition) Jewett Arts Center Art Gallery

*Zhengyang Yue '14, Architecture*

ADVISOR: *Daniela Rivera, Art*

The exhibition, Engagement in Nature, leads the audience into the Wellesley College Botanic Gardens to experience art works placed in a natural context. By creating art works with logs, branches and other rustic materials from campus, I want to express my strong feeling of attachment for Wellesley's landscape to viewers. Based on Wellesley Arboretum's geographical and environmental characteristics, I will choose specific areas to put these art works. The works will range from art structures to outdoor furniture, in both two-dimensional and three-dimensional forms. With the addition of these art works, the areas will be transformed into several sections including gathering spots, safe spaces or meditation areas for the Wellesley community. The exhibition will be presented as a tour, lead by myself as the artist, experiencing both the art works and the nature on campus. (Research supported by a Pamela Daniels Fellowship.)

**Bounders to Boundaries**  
(long performance)

Ruth Nagel Jones Theatre, Alumnae Hall

*Angela Bilkie '15, Anthropology and Theatre Studies, Katherine M. Bussert '16, Theatre Studies and English, J. Taylor D'Andrea '16, English, Vanessa K. Greenleaf '14, Theatre Studies and English, Natalie J. Solomon '16, Theatre Studies, Katherine L. Suchyta '15, Theatre Studies, Elizabeth G. White '15, American Studies, Elisabeth A. Yancey '16, Undeclared*

ADVISOR: *Nora Hussey, Theatre Studies*

Each academic year, there are nearly a dozen theatrical productions put on by students across the campus. From large-scale comedy to intimate drama, Wellesley College Theatre,

Upstage, and Wellesley Summer Theatre Company bring students and professionals together on and off stage. This presentation demonstrates short scenes from each of the eclectic performances presented to the community throughout the year.

**Chamber Music Society**  
(long performance)

Jewett Arts Center Auditorium

*Kathleen R. Regovich '16, Undeclared, Pallas C. Riedler '17, Undeclared, Shanti E. Van Vuuren '17, Undeclared, Bridget M. Walsh '17, Undeclared, Xi Zhang '15, Music*

ADVISORS: *David Russell, Music and Jenny Tang, Music*

This presentation is a performance and discussion of two works being studied by members of Wellesley's Chamber Music Society this semester, Felix Mendelssohn's Piano Trio No. 1 in D Minor, Op. 49 and A Birthday Hansel, Op. 92 by Benjamin Britten. In addition to performing the pieces, the presenters will discuss aspects of the works' form and construction, give historical context for their composition and provide background information on the lives of these two great composers.

## Science &amp; Technology

**Moody Blues**

(short talks) Pendleton Hall East 239

**Authenticity in Adolescents' Relationships: The Roles of Emotion Regulation and Perceived Parental Feedback**

*Madelaine R. Abel '14, Psychology*  
ADVISOR: *Sally Theran, Psychology*

Authenticity in relationships, defined as the ability to be open and honest with others about one's genuine thoughts and feelings, has been found to be positively related to interpersonal relationships. In contrast, lower levels of authenticity, or speaking and acting in opposition to how one really feels, lead to internalizing symptoms such as anxiety and depression. This study explores factors that contribute to the development of authenticity. Adolescents' emotion regulation processes and perceptions of parental validation and support are expected to predict authenticity in relationships with parents. Further, level of parental support is expected to moderate the relation between emotion regulation and authenticity. For example, adolescents who have difficulty regulating their emotions, but who have supportive parents, are more likely to be authentic in their relationships. This research

will contribute to our understanding of the development of authenticity. The findings will have theoretical and practical implications for adolescent mental health. (Research supported by the Psychology Department and the Office of the Dean of the College.)

### Happy Today, Happy Tomorrow: Associations between Mood and Future Thinking

*Leila T. Elabbady '16, Neuroscience, Syeda M. Mahub '15, Mathematics and Psychology, Yeeji Sung '14, Psychology*  
ADVISOR: *Margaret Keane, Psychology*

Previous studies have uncovered links between remembering the past and imagining the future, suggesting shared mechanisms between memory and future thinking. Memory has been found to be influenced by mood: when people are happy, they remember more positive memories, whereas when people are sad, they remember more negative memories. We examined whether future thinking is also influenced by mood in a similar way: Do people imagine more positive or more negative future events depending on their mood? Furthermore, research suggests that events further in the future are seen more positively than those closer in time. Thus, we examined whether imagined future events were further away in time when participants were in a positive mood than when they were in a negative mood. Our findings may provide insight on how we imagine the future as a result of our emotional state of mind.

### Do Defensive Pessimists Show Negative Mood Effects on Cognitive Tasks?

*Brigid E. Prayson '14, Psychology*  
ADVISOR: *Julie Norem, Psychology*

Research suggests that negative mood is associated with better performance on some cognitive tasks. This thesis project was conducted to examine whether defensive pessimists—a group characterized by their tendency to set low expectations for their performance and mentally simulate, in specific terms, what might go wrong prior to an anxiety-arousing situation—exhibit the same cognitive benefits that those in a negative mood have demonstrated in the literature. Participants' memory abilities were evaluated using an assessment created to test memory for previously presented images of everyday scenes. Memory accuracy and susceptibility to social processing errors were compared between defensive pessimists and controls. Defensive pessimists were expected to have more accurate memories and to be less susceptible to social processing errors than the other participants. Results and potential implications will be discussed.

(Funding provided by a student research grant from the Dean's Office and the Wellesley College Psychology Department.)

### Harmful Footprints: Pollution and the Earth (short talks) Pendleton Hall East 339

#### Searching for an Alternative to Wood Charcoal for Cooking in Developing Countries: Environmental Analysis of Agricultural Waste Charcoal

*Iglika B. Atanassova '15, Physics*  
ADVISOR: *Amy Banzaert, Extradepartmental*

Nearly half of the developing world depends on biomass, including wood and wood charcoal, for cooking. Burning biomass in kitchens creates indoor air pollution, leading to 1 million deaths annually. While the use of wood charcoal (WC) would cut these deaths in half, the environmental impact of switching from wood to wood charcoal would be devastating. This tension has inspired the search for an alternative cooking fuel with health impacts comparable to wood charcoal but reduced environmental impact. One proposal is agricultural waste charcoal (AWC), produced by the carbonization of agricultural wastes including sugarcane bagasse, a byproduct of the harvesting of sugar. A life cycle assessment was created in order to quantitatively evaluate the impacts of WC and AWC on the environment. Preliminary results suggest AWC may have comparable environmental impact to WC. (Research supported by the Susan Todd Horton Class of 1910 Internship Fund.)

#### Icebergs and Argon: Analyzing East Antarctic Glacial Transport in the Mid-Miocene Climate Transition

*Charlotte H. Benishek '16, Environmental Studies, Emma R. Howey '16, Geosciences*  
ADVISOR: *Elizabeth Pierce Davis, Geosciences*

Glacial sediment deposits off the coast of Antarctica offer a window into past glacial activity. Studying these dynamics is especially important today, as conclusions can be applied to understanding ice sheet dynamics. Our research analyzes marine sediment deposited off of East Antarctica by icebergs, during a period of ice sheet growth ~13.9 million years ago. We have focused on analyzing biotite and hornblende. By dating these minerals through the  $^{40}\text{Ar}/^{39}\text{Ar}$  method, we can learn where on Antarctica the sediment originated, and how the glaciers moved in the past. Although our core is located in Prydz Bay, preliminary data shows that it contains material from two distinct source areas, the local Prydz Bay region and Wilkes Land, which is >1000 km away. This does not follow the pattern of nearby cores, which

typically come from a single, distinct source area. These ramifications, and others, will be the topic of our presentation.

#### Morphological Changes to the Acehese Coastline in Sumatra, Indonesia, since the 2004 Indian Ocean Tsunami

*Caroline K. Templeton '14, Geoscience*  
ADVISOR: *Katrin Monecke, Geosciences*

The western Acehese coastline in northern Sumatra, Indonesia, receded on average 134 m due to subsidence and tsunami inundation in the course of the December 26, 2004 Sumatra-Andaman earthquake and tsunami. Here, we investigate the re-growth of the coast through field surveys, spatial imagery analysis, and numerical modeling. Three topographic surveys were conducted in 2009, 2012, and 2013 over a beach ridge plain in West Aceh. The coastline change was quantified by digitizing the shoreline on satellite and aerial images taken between 2002 and 2013 and by computing the shoreline change rates using the Digital Shoreline Analysis System (DSAS) developed by the US Geological Survey. In order to understand the complex interaction of land level changes, sediment supply, and hydrodynamic parameters, we have applied the coastal model UNIBEST-TC developed by Deltares to our data. A new prominent beach ridge formed but the coastline never fully recovered to its pre-2004 position. (Support from the Jerome A. Schiff Fellowship, Wellesley College Science Center Summer Research Program through the Priscilla C. Patton Endowment Fund, and the Brachman Hoffman small grants program)

#### Examining the Leaching Potential of Lead and Other Metals from Artificial Turf Via Weathering

*Janna M. Zimmermann '14, Environmental Studies*

ADVISOR: *Daniel Brabander, Geosciences*

In 2002, Wellesley installed a synthetic playing field manufactured by the company NextTurf. From an environmental health perspective, there is a concern that the water-soluble lead chromate pigments used to enhance the greenness of the grass fibers may leach into the surrounding environment. While previous analysis of turf samples from the Wellesley field indeed suggests increasing levels of lead being detected in the rubber infill of the turf (coinciding with decreasing levels of lead in the turf blades the metals may be leaching from), it is uncertain whether or not these metals can mobilize enough to leach into adjacent bodies of water. In this analysis, samples of turf grass and rubber infill will be subjected to leaching experiments. Repeatedly, samples will

be submerged in rainwater and dried, and the collected effluents will be analyzed to assess the mobility of metals contained in Wellesley's turf. The purpose of this experiment is to clarify the impact of weathering on the leaching potential of lead and other metals as well as the long-term fate and transport of these elements.

### What's Cooking? Experiments in the Lab and the Class (short talks) Pendleton Hall West 117

#### Cooking Chemistry

*Alexandra Grzywna '14, English*

ADVISOR: *Didem Vardar-Ulu, Chemistry*

What molecular interactions cause dough to rise? How is milk transformed to cheese? While cooking may be perceived as a process in which raw ingredients are magically transformed into a delicious food product, the magic becomes not so mysterious when chemical concepts are applied. In my talk, I will share my experiences teaching the Molecular Gastronomy course at the Explo school, where I explored how manipulating variables such as pH and temperature cause physical and chemical changes in food, and how transforming and combining states of matter create delicious textures. I'll also discuss how the polarity of lipids, saccharides, and proteins affects texture, particularly focusing on the denaturation and coagulation of proteins such as gluten and gelatin. Because the same chemical principles in the laboratory govern those in the kitchen, it turns out we can not only eat food, but learn chemistry from it too.

#### Ultraviolet Absorption Properties of Diatomic Sulfur

*Hannah E. Herde '14, Physics and Classical Civilization*

ADVISOR: *Glenn Stark, Physics*

Diatomic Sulfur, S<sub>2</sub>, is a powerful absorber of ultraviolet light. It is present in the atmospheres of Jupiter and its moon, Io. It is very difficult to obtain an S<sub>2</sub> spectrum in the laboratory; when heated, elemental sulfur forms many different gaseous species including S<sub>2</sub>, S<sub>3</sub>, and S<sub>4</sub>. We use a two-temperature furnace and absorption cell to create conditions of high temperature and low pressure, which favor pure S<sub>2</sub> formation. Using high resolution measurements from the National Institute of Standards and Technology in Gaithersburg, Maryland, we quantified oscillator strengths for atmospheric modeling purposes. This work is generously supported by the Jerome A. Schiff Fellowship and the NASA Planetary Atmospheres Program.

#### Science Center Special Collections: The History of Science Instruction at Wellesley College

*Elizabeth C. Kashinski '15, English, Claire I. Milldrum '15, Art History*

ADVISOR: *John Cameron, Biological Sciences*

Since its founding, Wellesley College has taken a "hands-on" approach to science education that originally required large numbers of anatomical and other models, scientific instruments, lithographed charts, biological specimens and more. As time passed and technology advanced, most of these objects fell into disuse. A number of them were lost or discarded, but those that remain are important in understanding the history of science pedagogy at the College and science education overall. Our goal for this project was to inventory, catalog, and if necessary rehouse, important Science Center collections. While far from being complete, we believe this information can only add to a more complete understanding of our shared campus. It is our hope that over time, with help from people across campus, these precious artifacts that tell Wellesley's rich history will be shared both locally and globally.

#### Electron-Induced Reactions of Ammonia of Astrochemical Interest

*Katherine E. Shulenberg '14, Chemistry*

ADVISOR: *Christopher Arumainayagam, Chemistry*

Ammonia is the most abundant nitrogen-containing compound within both high-mass and low-mass protostellar regions, which are known to contain high molecular diversity; including many prebiotic species. It has been proposed that silicate and carbonaceous dust particles provide sites for the formation of ices of various simple compounds, including ammonia. These ices are then bombarded with high energy photons and cosmic radiation ( $E_{\text{max}} \sim 10^{20}$  eV). We propose that the low energy electrons that originate when high-energy radiation interacts with matter are the driving force behind the reactions occurring within these interstellar ices.

From temperature programmed desorption (TPD) experiments we have identified the formation of hydrazine (N<sub>2</sub>H<sub>4</sub>), diazene (N<sub>2</sub>H<sub>2</sub>), and molecular hydrogen (H<sub>2</sub>) after irradiation with 1000 eV electrons for five seconds at an incident current of 1.5  $\mu$ A. We have also identified hydrazine and diazene after 150eV electron irradiation consistently at high electron flux (10  $\mu$ A). Hydrogen has been identified at incident energies as low as 5 eV. This evidence can help us determine the mechanism by which ammonia dissociates by interacting with high and low-energy electrons.

#### Investigating Protein-Lipid Interactions in the Elmore Lab (panel discussion) Founders Hall 120

*Mwangala P. Akamandisa '15, Biological Chemistry, Julia A. Klaipe '14, Biological Chemistry, Maria A. LaBouyer '15, Biological Sciences, Jane E. Lodwick '14, Chemistry, Sukin Sim '16 Chemistry and Mathematics*

ADVISOR: *Donald Elmore, Chemistry*

The Elmore lab is interested in understanding the interactions between proteins and the lipid membranes of bacterial and eukaryotic cells. An ongoing project in the lab involves studying the structure-function relationships of histone derived antimicrobial peptides (AMPs), which selectively kill bacterial cells. A recent collaboration with the Peterman lab seeks to determine the relative importance of amino acid residues in the Sec14 protein domain, a lipid transfer domain that is nearly ubiquitous in eukaryotes, for specifically binding lipids essential to cell signaling. We will discuss the computational and experimental methods we use to address these questions and the insight we have gained into these systems.

#### POSTER SESSION Science Center Focus

##### Study of the Reduction of Horse Cytochrome C by Porcine Heart Ubiquinol-Cytochrome C Reductase Using ITC and UV-vis

*Sebiha M. Abdullahi '15, Biological Chemistry, Alice Liao '15, Biological Chemistry*

ADVISOR: *Elizabeth Oakes, Chemistry*

The mitochondrion, the powerhouse of the cell, contains a series of complexes which form the electron transport chain where cellular energy (ATP) is produced. Cytochrome bc<sub>1</sub> (cytochrome C reductase) is an example of such a complex. Cytochrome bc<sub>1</sub> transfers electrons from co-enzyme Q to cytochrome C when both molecules are bound to it in specific locations. Ubiquinone is the fully oxidized form (lacking the electrons) and ubiquinol is the fully reduced form (carrying the electrons) of coenzyme Q<sub>10</sub>. Although there are two pairs of binding sites on cytochrome bc<sub>1</sub>, to avoid electron leakage and to maximize reduction centers only one site of each type is activated at a time (Covian et al., 2008). We studied the binding interaction of cytochrome bc<sub>1</sub> to cytochrome C or ubiquinone using isothermal titration calorimetry (ITC). Secondly, we studied the kinetics of the reduction of cytochrome C and the oxidation of cytochrome bc<sub>1</sub> using UV-Vis spectroscopy. Similar rates of reduction and oxidation respectively may suggest that cytochrome C

is reduced by cytochrome bc1 one at a time. These experiments are essential to carry out since ATP production is the basis of eukaryotic life. Our experiments are designed to show the ratio of the kinetic rate constants of electron donors to carriers and to characterize the thermodynamic stability of their interaction during electron transport.

### The Antioxidative Potency of Pomegranate Pulp and Peel

*Alyssa F. Bacay '14, Biological Chemistry, Amanda T. Woo '14, Biological Chemistry*

ADVISOR: *Elizabeth Oakes, Chemistry*

Antioxidants are essential for biological processes and maintenance of human health. Generation of reactive oxygen species (ROS) and free radicals occurs naturally in vivo. If ROS are created in excess, oxidative stress can result and subsequently cause disease (Wilcox et al., 2004). Pomegranate juice is a potential treatment to ease or prevent detrimental effects caused by oxidative stress. Antioxidants prevent oxidation of molecules thereby preventing damage to cells by ROS (Singh et al., 2001). Phenols are a type of antioxidant and have free radical scavenging activity. They function by donating a hydrogen atom to a free radical species, effectively interrupting the chain reaction. Phenols are abundant in pomegranates (Scalbert et al., 2005). Our experimental goal is to determine the antioxidative potency of pomegranate pulp and peel based on total phenolic content and total ferric reducing power.

### Pomegranate Antioxidants Scavenge Reactive Oxygen Species and Inhibit Peroxidase En

*Shira E. Bleicher '14, Biological Chemistry, Ava K. Mokhtari '14, Biological Chemistry, Raji R. Nagalla '14, Biological Chemistry*

ADVISOR: *Elizabeth Oakes, Chemistry*

Antioxidants are a large group of molecules known for their anti-inflammatory properties. Polyphenols are a specific type of antioxidant found in a variety of phytochemical-bearing substances. Due to its relatively high polyphenol content, pomegranate has been a primary focus regarding the medicinal powers of antioxidants. Dietary polyphenols have been shown to play a vital role in the prevention and treatment of cancer, aging and inflammation; however, the exact pathway and target through which they inhibit sub-cellular pathways of inflammation is not yet known (Pervaiz and Clement, 2007; Bachoual et al., 2011). The goal of this project is to use a colorimetric assay to evaluate the efficacy and mechanism of action of antioxidants in the peel and meat of the pomegranate fruit

to determine whether pomegranate polyphenols work by scavenging for reactive oxygen species (ROS) or if they directly interact with enzymes linked to the ROS and inflammatory pathway.

### Where Do Introduced Populations Learn Their Tricks? Searching for the Geographical Source of a Species' Introduction to the Galápagos Archipelago

*Adrienne C. Cheng '14, Biological Sciences, Jasmine N. Gums '15, Women's & Gender Studies*

ADVISOR: *Andrea Sequeira, Biological Sciences*

The success of species introductions can be traced back to the interaction between their genome and the environment. The genetic richness underlying such success is either imprinted in the genetic patterns at the source location, or gained in situ through demographic expansion and multiple introduction pulses. The weevil *Galapaganus howdenae*, introduced to Galápagos from mainland Ecuador, is a prime example of an introduced species with an expanding geographic range. Through microsatellite genotyping, we aim to answer important questions: Are the genetic patterns of island populations a function of their introduction history or already present in source populations? What are the geographic origins of the island populations? High levels of genetic variability in the introduced range might indicate that introduced populations have the genetic potential to colonize other areas. The results could inform measures that attempt to control accidental inter-island transfer and provide insight into the genetic background of biological invasions.

### Addressing Nima's Challenges with the Implementation of a Rainwater Management System and Local Power Generation

*Cindy E. Coffee '16, Architecture*

ADVISOR: *Abigail Mechtenberg, Energy Systems*

Nima is a suburb of the capital of Ghana, Accra, with a very high density exceeding 250 persons per hectare. It is one of the oldest areas in Accra (in addition to Ussher Town, James Town and Accra New Town) mostly comprising of immigrants from the three Northern Regions of the country. During the two main rainy seasons, April to July and September to November, the poorly planned narrow streets and even narrower walkways turn to mud and are inaccessible from the lack of a proper drainage system. In the Fall of 2013, while taking a class called Energy Systems in Urban Design at the Olin College of Engineering, I chose Nima as my urban site in need of having its challenges addressed. The use of Homer Energy was also implemented

in finding out how local power generation will benefit the site.

### An Analysis of East Antarctic Sediment Samples from the Mid-Miocene Climate Transition

*Michaela A. Fendrock '15, Geosciences, Celia M. Honigberg '15, Geosciences, Diana Lee '15, Environmental Studies, Kaisa L. Wayrynen '14 Biological Sciences*

ADVISOR: *Elizabeth Pierce Davis, Geosciences*

The Mid Miocene Climate Transition (MMCT), a period 14.2 to 13.8 million years ago, represents one of the major changes in the earth's climate during the Cenozoic. Global average temperatures cooled, leading to major ice sheet growth in East Antarctica. Evidence for this ice sheet growth includes proxies such as sea level records, sediment records and oxygen isotopes, as presented in a variety of previous studies. In order to further examine the variation in movement of East Antarctica's ice sheet growth, we have measured the amount of ice rafted detritus (IRD) deposited in sediment in the Southern Ocean off the margin of East Antarctica.

Here we examined sediments from Integrated Ocean Drilling Program (IODP) Expedition 318, Site U1356, (core 19R, sections 1-5), we determined the clast count and examined the lithic grains from the sediment deposited about 14 million years ago. We processed 41 samples by first drying the samples, then washing the samples through a 63  $\mu\text{m}$  sieve. After drying the >63 $\mu\text{m}$  portion of the sample, we further sort the sample into three parts: 63-150 $\mu\text{m}$ , 150 $\mu\text{m}$ -1mm and >1mm. We examined and classified the lithic grains in the >1mm portion of our samples. These lithic grains are IRD.

Our data adds to the initial shipboard data. Both the shipboard data and our data indicate that there were several large pulses of IRD during the MMCT. Previous data from benthic oxygen isotope records tell us that this was a dynamic time in the growth and retreat of the Antarctic ice sheets, but this is the first time that we have direct evidence from sediments derived by ice rafting that confirms the benthic oxygen isotope data.

### CodeSync: A Collaborative Coding Environment for Novice Web Developers

*Monica S. Feldman '14, Computer Science*  
ADVISOR: *Scott Anderson, Computer Science*

CodeSync is a collaborative coding tool geared toward beginning web development students. It solves problems that Wellesley's CS110 students face while trying to collaborate with one another.

CS110 thrives on collaborative work; however, the current tools used to write code and move files don't properly support collaboration. In fact, these tools undercut it by allowing collaborators to overwrite each others' code. Tools without these flaws exist, however they're pitched for professional programmers.

CodeSync works similarly to Google Docs, which enhances collaboration by allowing documents to be edited by multiple people, even simultaneously. In this environment, users can easily create web-based coding projects that others can join and contribute to using HTML, CSS, and JavaScript.

Through the introduction of CodeSync, a collaborative coding tool specifically geared toward beginning web development students, students will find collaborative coursework to be easier, more reliable, and more enjoyable.

### To Help or Not to Help: Associations Between Socio-Emotional Language and Prosocial Behavior in Preschool

*Gabriella F. Freda '14, Psychology*  
*Talia S. Schwartz '14, Psychology*  
ADVISOR: *Jennie Pyers, Psychology*

This research investigated the relationship between socio-emotional language and prosocial behavior among preschool children. We hypothesized that children who demonstrated prosocial behaviors, such as helping pick up dropped paper clips, would use more socio-emotional words in their responses to questions than children who did not help, while controlling for general language ability. Participants were 34 preschoolers, ages 3–5-years old (18 boys, 14 girls,  $M_{age} = 50.41$  months,  $SD = 6.20$  months). Prosocial behavior was measured in terms of children's demonstration of helping behavior by picking up spilled paper clips; the children who did not pick up the paper clips were considered non-helpers. Results from univariate analysis of variance and t-tests showed no significant difference between the socio-emotional language use of helpers versus non-helpers. Although no significant results were found to support our hypothesis, we did find that over half of all the children demonstrated helping behavior. Thus, prosocial behavior may develop earlier than three or four years old and further aspects of cognitive development might mediate its relationship to language.

### Optimization of a High Throughput Protein Kinase A Activity Assay to Compare Inhibitor Efficacy

*Lara N. Gechijian '14, Biological Chemistry*  
*Sara Martin '14, Biological Chemistry*  
*Kendall R. Tada '14, Biological Chemistry*  
ADVISOR: *Elizabeth Oakes, Chemistry*

Protein kinase A (PKA) controls differentiation and proliferation pathways by phosphorylating proteins involved in these processes. PKA modulates these proteins by transferring a phosphate group from ATP to serine or threonine side chains on the protein target. The phosphorylation activity is regulated by cyclic AMP (cAMP), an essential intracellular signaling molecule. cAMP activates PKA by binding to and releasing the regulatory subunits, rendering the catalytic subunits of PKA active. Deregulation of proliferative cAMP-PKA pathways has been implicated in several cancers as constitutively activated PKA can lead to uncontrolled cell division (Caretta, 2011; Chiaradonna, 2008). As a result, PKA is being considered as a potential target in cancer therapies (Hochbaum et al., 2008). Currently there are many PKA inhibitors that vary in efficacy. However, there is no standard procedure to evaluate these inhibitors. A common measure of efficacy is the concentration of an inhibitor required to reach 50% inhibition of enzyme activity (IC<sub>50</sub>). The IC<sub>50</sub> value is extremely dependent on experimental conditions, and as a result, the IC<sub>50</sub> of different inhibitors are not comparable unless they were determined under the same conditions (Ward, 2012). In the current study, we aim to optimize a high-throughput PKA activity assay in order to compare the efficacy of two PKA competitive inhibitors, Staurosporine and H7.

### Induction and Structural Characterization of Hen Egg White Lysozyme Amyloid Fibrils in the Presence and Absence of Epicatechin Gallate

*Lelia G. Gessner '14, Biological Chemistry*  
*Mengyu Wu '14, Biological Chemistry*  
ADVISOR: *Elizabeth Oakes, Chemistry*

Amyloid fibrils have been implicated in many diseases such as Alzheimer's disease, type 2 diabetes, and Parkinson's disease. They are formed by structured aggregation of misfolded precursor proteins and generally result in a loss of functionality but may induce cell death (Bellotti et al., 1999). Currently there are no treatments for amyloidosis, only therapies to treat complications. Elucidation of the process of amyloid fibril formation is integral towards developing an overall understanding of properties related to protein conformation and stability.

Furthermore, green tea polyphenols (GTP) have been shown to disrupt amyloid fibril formation and aid in fibril depolymerization. In order to characterize amyloid fibril formation and explore the therapeutic effects of GTPs in amyloidosis, hen egg white lysozyme (HEWL) aggregation was induced in the presence and absence of GTP. HEWL exhibits a characteristic secondary structural shift from alpha helix to beta sheet during amyloid fibril formation. It has been shown to form fibrils in vitro under various denaturing conditions such as extreme pH, ion addition, and in the presence of alcohols (Chiti et al., 1999; Fujiwara et al., 2003; Tanaka et al., 2001; Yonezawa et al., 2002). Optimal conditions for fibril formation were screened and circular dichroism (CD) spectra were obtained to analyze secondary structural changes. Dynamic light scattering (DLS) was used to measure macromolecular changes in the size and homogeneity of the amyloid aggregates. Results were ultimately employed to elucidate structural changes in HEWL during aggregation and to explore the efficacy of polyphenols as therapeutic treatment for amyloidogenesis.

### Extending Blockly, a Visual Programming Framework

*Xixi Lu '15, Computer Science*  
ADVISOR: *Franklyn Turbak, Computer Science*

MIT App Inventor is an online blocks-based programming environment that allows even users with little to no programming experience to create Android apps. The blocks-based environment is based on the Blockly framework, a web-based graphical programming editor where users drag blocks together to create computer programs. This past summer and semester, I collaborated with the MIT App Inventor Development team on extending Blockly and making App Inventor more user friendly. I worked on developing a number of new features, which includes zooming and scaling for the Blocks Editor workspace, designing a number of different block connector shapes that each indicate a different variable type, implementing a way to allow these different connector shapes co-exist in the same workspace, and creating a new block shape that can help visualize variable scoping.

### Grading Experimental Autoimmune Uveitis in Mice with Spectral Domain Optical Coherence Tomography

*Mehwish A. Mirza '15, Neuroscience*  
ADVISOR: *Bevil Conway, Neuroscience*

Experimental autoimmune uveitis (EAU) is a rodent model of human autoimmune uveitis, a condition often caused by autoimmune

disorders that results in the inflammation of the uvea. EAU provides a preclinical model for the assessment and therapeutic treatment of autoimmune retinal inflammation and posterior uveitis. EAU was induced in C57BL/6 mice by injection of interphotoreceptor retinoid-binding protein (IRBP: 1-20) combined with complete Freund's adjuvant (CFA). High-resolution spectral domain optical coherence tomography (SD-OCT) was used as a clinical method for fundus imaging and evaluating EAU outcomes in mice overtime. Mice were sacrificed at various time points, and eyes were frozen, cross-sectioned, and stained with hematoxylin and eosin (H&E) in order to match the histology with the representative OCT image. At peak stages of EAU, images show retinal folds, photoreceptor damage, and retinal detachment. SD-OCT allows the user to define the representative morphologic details of EAU in individuals during disease progression. Additionally, these findings are closely correlated with underlying histologic changes at each time-point.

### Two-Choice Extinction: A Behavioral Assay for Cognitive Flexibility in the Mouse Model of Fragile X

*Madison D. Taylor '14, Neuroscience*

ADVISOR: *Virginia Quinan, Neuroscience*

Fragile X syndrome (FXS), the leading known cause of Autism spectrum disorder, is the most common form of inherited mental retardation. FXS is a single gene disorder caused by the loss of an mRNA-binding protein, FMRP. Because there is a lack of regulation on the translational process, there is increased protein synthesis at synapses, thought to account for many behavioral phenotypes in Fragile X. This project uses a novel behavioral assay in Fmr1 KO mice to test whether indirect pharmacological down-regulation of mGluR5-mediated signaling is sufficient to correct the phenotype. We are measuring the cognitive flexibility of cross-mice to determine if loss of FMRP can be corrected by targeting the mGluR5 pathway. We are interested in extinction of a learned behavior because of noted cognitive flexibility issues in Fmr1 KO mice and believe that extinction is a viable measure of cognitive flexibility. (Research supported by HHMI, MIT, and SCSB Grant)

### Extending Quizly

*Bhargavi Ramanathan '16, Undeclared*

ADVISOR: *Franklyn Turbak, Computer Science*

Quizly is a teaching tool for App Inventor developed by Ralph Morelli (Trinity College). It is used to make quizzes that can be embedded into web pages. In a Quizly quiz, the student is presented with a programming task, and

must assemble App Inventor blocks that solve that task. It works by comparing the teacher-provided solution to the student's solution in one of three ways: exact block-for-block match, expression evaluation, or function definition. I extended the function definition category, permitting the use of helper methods and global variables in teacher and student solutions. I also added a fourth category, procedure definition, permitting the testing of procedures modifying global variables, and subsequently this category was merged with the function definition category. (This material is based upon work supported by the National Science Foundation under Grant Number DUE-1226216.)

### Studies of the Metabolism of FDA Approved Drugs

*Erin C. Yang '16, Chemistry*

ADVISOR: *Adrian Huang, Chemistry*

Drug metabolism is the biochemical modification of pharmaceutical substances respectively by living organisms, usually through specialized enzymatic systems. Drug metabolism often converts lipophilic chemical compounds into more readily excreted hydrophilic products. The rate of metabolism determines the duration and intensity of a drug's pharmacological action. Our goal is to find the trend of the metabolism of FDA approved drugs by cytochrome P450.

## Social Sciences

### Learning Differences or Learning Differently?

(short talks) Science Center 396

### “Don't Anthropomorphize Your Molecules. They Hate It When You Do That.” Examining Personification and Narrative Technique in Chemistry Education from a Feminist Perspective

*Anna R. Blumfield '17, Undeclared*

ADVISOR: *Noah Rubin, Education*

Personification and narrative techniques often surface when we try to grasp an abstract concept for the first time. “So, oxygen is happy when...” is not an unusual phrase in an introductory chemistry classroom. These techniques are also often looked down upon, especially on a professional level. Interviews in high school and college settings, as well as pedagogical theory and experimental science education research reveal where and when these techniques are beneficial to learners. The relationship between personification and STEM education for women is also examined, based on feminist theory suggesting that women and men often learn differently. The research concludes with questions about the

potential to create an effective curriculum which embraces, rather than avoids, personification in introductory chemistry education.

### Stronger Communities, Stronger Schools - The Creation and Evolution of a Transformative Partnership

*Loren S. Cahill '14, African Studies, Katherine H. McCann '15, Peace & Justice Studies*

ADVISOR: *Soo Hong, Education*

We are studying the Wellesley College organization, Stronger Communities, Stronger Schools (SCSS), a student-run organization that partners with two Boston-based community organizations and a Boston public school to support students and families in and out of schools. We explore the concept of critical service learning and its impact on both college students and local communities. We explore the experiences of Wellesley student volunteers and the ways their participation in SCSS influences their perspectives on education and social change, shapes the continuing partnership with local communities and informs their personal beliefs and experience. This study will be used to help us to inform and perfect our organization's mission and practice. We hope that our work can illuminate how other collegiate institutions can create a mutual and sustainable partnerships.

### English Language Learners in Rural Alabama: Their Specific Needs and the Future of an Increasing Population

*Sarah B. Hitchner '15, Women's & Gender Studies*

ADVISOR: *Wendy Robeson, Wellesley Centers for Women*

English Language Learners (ELLs) are students, both U.S.-born and foreign-born, who need support in learning English in addition to mastering the academic requirements of their mainstream classrooms. When faced with the dual load of learning English and keeping up in their academic classes, many ELLs are at risk of falling behind their peers. Through the Shirley R. Sherr Student Research internship at the Wellesley Centers for Women, I explored the challenges faced by English Language Learners in rural Alabama. ELL students living in rural Alabama face additional challenges when it comes to access to support and resources such as low numbers of students speaking the same language. With the Alabama State Department of Education's steps to further support ELLs, recent growth in the number of ELLs nationwide, and the continuing growth and diversity of Alabama's population, there is hope for increased support for ELLs in rural Alabama in the future.

### Status Inequalities: A Study of the Impact of Socioeconomic Disparities on Educational Experience

*Morgan G. Johnstonbaugh '14, Sociology*  
 ADVISOR: *Thomas Cushman, Sociology*

Can educational opportunity combat socio-economic disadvantage? In the United States today inclusionary policy is often perceived as a valuable method for increasing educational opportunity for students in underserved areas. Unfortunately, this technique often fails to meet the needs of students whom it is meant to assist. I gained greater insight into this problem by interviewing college students from a wide variety of racial and socioeconomic backgrounds. These interviews allowed me to identify the key social resources that contribute to educational success as well as the diverse barriers that students face when they experience economic hardships. Strong patterns in my data highlight the importance of social support as well as access to educational and extracurricular opportunities in creating a positive educational experience. Therefore, the development of effective educational policy relies on the construction of a more comprehensive definition of educational opportunity. (Research Supported by The Office of the Provost and Dean of the College)

### Equal Before the Law?

(short talks) Pendleton Hall West 212

### The Effect of Attorneys' Gender, Age and Goal on Jury Bias

*Justyna D. Jakubaszek '14, Political Science and Psychology*  
 ADVISOR: *Linda Carli, Psychology*

This study examined the effects of a lawyer's age, gender, and goals on biases in jury decisions. Participants listened to the legal arguments of a lawyer in a case involving libel. Participants were randomly assigned to hear either a male or a female attorney, who is either 30 or 50 years old. Additionally the participants were told that the attorney was working for compensation and thus had an agentic goal (focused on the self), or was working pro bono and thus had a communal goal (focused on the community). After listening to the legal arguments, participants evaluated the attorney and the attorney's message. I hypothesized that female attorneys would be less influential than male attorneys overall, and especially in conditions where the attorney is older and the goal is agentic.

### The Right to Choose Privacy: An Exploration of the Legal, Social and Cultural Ramifications of Legislating the American Family Ideal in the United States

*Katherine E. Leung '14, Political Science and History*

ADVISOR: *Brenna Greer, History*

American Law is demonstrative of the political and cultural environment in which it was created – whether passed through a state or federal legislature, or as the result of a Supreme Court decision. Between 1960 and 1973, a series of landmark Supreme Court cases forever altered the landscape of American privacy law and the permissibility of Americans' decisions about how to construct their families. These cases were decided by nine men, and influenced by the men and women who challenged antimiscegenation laws, birth control bans and abortion restrictions. This project explores the development of these cases and how they shaped the American family.

### Legal and Ethical Issues Pertaining to the Ethical and Religious Directives in Catholic Health Care

*Anna K. Tupper-Bridges '14, Religion and Political Science*

ADVISOR: *Sharon Elkins, Religion*

One in six hospital patients in America are treated at a Catholic hospital, and in the last three years at least 20 Catholic hospitals have merged with secular ones. Catholic-affiliated hospitals must abide by the United States Council of Bishops' Ethical and Religious Directives, and merged hospitals are frequently required to follow these directives. One of the core set of directives, having to do with "the beginning of life," do not allow any Catholic-affiliated hospitals to offer a range of reproductive services, including abortion, contraception, and sterilization. As a result of mergers, formerly secular hospitals frequently have to adopt the directives. However, the directives are often applied in an ad hoc manner, and hospital administrators and doctors sometimes attempt to circumvent them in confusing and roundabout ways. Ultimately, Catholic-secular hospital mergers lead to a variety of legal challenges, most of which are successful on the basis of medical malpractice laws.

### The Human Face of Cancer (panel discussion) Founders Hall 126

In the time that each of us spent analyzing various aspects of cancer epidemiology, we realized that cancer is indeed multi-faceted and not simply a quantitative field of study.

Behind every statistic of cancer incidence and cancer mortality in the world, there is dynamic interplay including political struggles between a population and a government towards seeking healthcare, eliminating cancer risk factors, silencing the cultural stigmas of cancer, and even influencing an economy. In our panel presentation, we hope to present to you a sampling of the numbers we found, and the compelling cancer narratives behind them.

### Cancer and Anthropology: A Global Glimpse at "The Dread Disease"

*Subayla Islam '15, Neuroscience*

ADVISOR: *Anastasia Karakasidou, Anthropology*

According to the World Health Organization, cancer incidence is the number of new cases and cancer mortality is the number of deaths due to cancer in a given period of time. Last year, I collected and analyzed cancer incidence and mortality rates in multiple countries including the United States, China, Greece, Macedonia and Turkey. Regions of the world with the highest incidences of cancer comprised much of the Western world, in contrast to the lowest incidences of cancer comprising many countries in Africa. Particular cancer types in specific countries were also examined, allowing me to identify potential disparities such as high incidence of cancers in China related to the digestive tract, compared to that of neighboring countries, including Mongolia, Japan, and India. A case study of the "cancer village phenomenon" focused on environmental and economic conditions that contributed to the recent rise in cancer incidence in much of rural China. (Research supported by the Barbara Peterson Ruhlman Endowed Fund for Summer Research in the Social Sciences)

### Narratives of Cancer in American and Chinese Social Media

*Jaymee Sheng '16, Mathematics*

ADVISOR: *Anastasia Karakasidou, Anthropology*

Cancer used to be a taboo in many societies, and perhaps still is in certain parts of the world. The Chinese in general had cancer as a taboo and stigma. The personal experience of cancer at the physical, emotional, psychological, and social level used to be shared at most with family and friends. Social media, however, transforms the cancer experience by providing a new platform for the patient to instantly share feelings and thoughts stemming from the illness both verbally and visually to a broad audience. It also generates a new circle of support from fellow Internet users and sometimes even mass media attention for the patient. Various metaphors of battle and suffering used by cancer

patients on the American social networking site, Twitter, and on the equivalent Chinese micro-blogging site, Weibo, show similarities as well as differences that reflect the fundamentally different structures and cultures of the two societies. (Research supported by the Sophomore Early Research Program)

### **International Pink: A Study of International and Transnational Breast Cancer Organizations**

*Tinsa A. Harding '16, Psychology*

ADVISOR: *Catia Confortini, Peace & Justice Studies*

Over recent years, the incidences of and deaths from cancer are on the rise in resource-poor settings. Breast cancer alone is the second leading cause of death among women. Unfortunately, the rates of mortality are disproportionately high in the Global South. Despite this, only a small portion of the necessary resources are allocated to these most vulnerable populations. I am looking into how different breast cancer organizations present themselves, and what their different missions, initiatives, and images are, in order to better understand international and transnational breast cancer activism. The comparison will aim to identify the different purposes of the organizations, and how each is inscribed in the larger world of breast cancer activism. My hope is that this research will allow me to identify the views and postures of these organizations towards the growing breast cancer burden in resource-poor settings. (Research supported by the Sophomore Early Research Program)

## **POSTER SESSION**

### **Science Center Focus**

#### **Sociopolitical Involvement Among LGBTQ People of Color**

*Rachel P. Arrey '16, Religion and Political Science, Allyson L. Pyers '15, Political Science and Women's & Gender Studies*

ADVISOR: *Habrie Han, Political Science*

How does negotiating multiple marginalized identities influence one's involvement in social and political life? Drawing from the 2010 Social Justice Sexuality Project, a national survey of 4,953 people, roughly 3,000 of whom are lesbian, gay, bisexual, or transgender (LGBT) people of color, we examine LGBT people of color's levels of sociopolitical involvement, or "connectedness to the social and political life of a community." Based on the data, we suggest that LGBT people of color are more likely to be involved in organizations specifically geared towards LGBT people of color than in groups targeting either identity category individually.

These findings have implications for policy, organization strategies and priorities, and further political science research in the fields of political involvement and intersectional marginalization.

#### **Archaeological Approaches to Understanding Socio-environmental Dynamics of the Anthropocene**

*Tenzin Choetso '16 (Olin),*

*Beatrice G. Denham '14, Architecture, Stephanie L. Gebhardt '14, Environmental Studies, Sumner M. Hanula '17, Undeclared, Heike H. Jacob '17, Undeclared, Scarlett Kao '16, International Relations and Economics, Sophia Liu '14, Environmental Studies, Kristen M. Oleskewicz '17, Undeclared, Sara Ro '14, Economics, Emma D. Scalisi '17, Undeclared, Sara A. Vannah '17, Undeclared, Kelly A. Zimmerhanzel '17, Undeclared*

ADVISOR: *Benjamin Vining, Anthropology*

Among the most pressing environmental issues today are concerns about human impacts on natural environments, and susceptibility of socio-economic infrastructure to environmental change. These represent complex networks of causal factors, which have developed over long time spans. Yet, historical records and modern instrumental data that can help us understand environmental and climatic change typically extend at most only a few centuries backwards in time. Here, we use data from archaeological contexts to model and understand long-term socio-environmental impacts and responses to climate change. We explore the cumulative effects of land use, industrial activities, and natural resource exploitation on modern ecosystem functioning, health, and climatic patterns. We test paradigms that help explain socio-ecological interactions, and evaluate these against archaeological and modeled systems. This work helps us understand the development of environmental systems dominated by anthropogenic agency—resulting in the Anthropocene period of global change.

#### **Learning and Teaching through the Wellesley Preparatory Chorus**

*Kendall A. Clites '14, Music*

ADVISOR: *Lisa Graham, Music*

At the beginning of every school year, Wellesley students audition for numerous singing groups on campus. Unfortunately, there are many who love to sing in groups but do not yet have the musical ability to qualify for the auditioned groups. To address this issue, a non-auditioned training choir was created. The purpose of the group is to provide a singing opportunity to all who are interested, to develop vocal and musicianship technique, and to bring music to the local community through service-oriented

performances. The following project is an analytical look at the essential parts of a choir, focusing on the choir's contribution to the musical development of the singers and the leadership development of the director. The poster will explore techniques of ensemble instruction, findings on the effectiveness of these techniques, and major takeaways from the experience.

#### **"It's Gotta Be the Shoes": A Sneaker Ethnography, Revisited**

*Chanel G. Geter '14, Sociology and American Studies*

ADVISOR: *Yoon Lee, English*

In today's society, conspicuous consumption discretely guides almost all of our purchasing decisions, particularly when shopping for attire. For each cultural group, dressing for "success" has different implications, as varying racial groups have unique qualities to demonstrate through their purchase of clothes and shoes. For young Black men, sneaker culture dictates a large majority of their fashion decisions, with entire clothing lines being sculpted from the foundation of a popular gym shoe. For example, the Air Jordans brand has proliferated urban fashion trends ever since its 1989 introduction into popular culture via a commercial entitled "It's Gotta Be the Shoes," starring Michael Jordan and Spike Lee. In my research, I question whether affinity for and identification with the Air Jordans brand (specifically: the Jordan shoe line) can be determined according to racial background and cultural tradition. Attend my 2014 Ruhlman presentation to learn why "it's gotta' be the Jordans!" (Supported by the Mellon Mays Undergraduate Fellowship program at Wellesley College)

## Humanities

**War, Then Peace**

(short talks) Pendleton Hall East 139

**Rwanda's Post-Genocide Gacaca Courts: Localizing Justice to Advance National Reconciliation***Charlotte J. Hulme '14, Political Science*ADVISOR: *Stacie Goddard, Political Science*

During the Rwandan genocide, 800,000 Tutsis were killed by extremist Hutus in less than 100 days. After the genocide, the government initiated "gacaca" courts, based on a traditional community conflict resolution system, to handle the overwhelming number of crime cases from the genocide. Gacaca has been controversial. For some, it represents the best possible method of addressing impunity while advancing reconciliation in this exceptional context with no "good" options. For others, gacaca represents retributive justice by the Tutsi-dominated government, never destined for success in bringing reconciliation to communities. Did the gacaca process, as imagined by the state and implemented in communities nationwide, support reconciliation processes among survivors and perpetrators? Considering data gathered from interviews with Rwandans sharing their insights into the process and outcomes of gacaca in their communities, I argue that gacaca was a remarkably successful experiment in finding a delicate balance between addressing impunity and advancing reconciliation. (Research supported by a Schiff Fellowship and a Barnette Miller Research Grant)

**Tres Ventanas sobre la Revolución Sandinista de 1979: Discursos Políticos, Voces Poéticas y Testimonios Orales de Ciudadanos Nicaragüenses de Hoy [Three Windows of the Sandinista Revolution of 1979: Political Speeches, Poetic Voices, and Oral Testimonies of Nicaraguan Citizens from Today]***Rebecca H. Kimball '14, Economics and Spanish*ADVISOR: *Nancy Hall, Spanish*

How is the 1979 Sandinista Revolution in Nicaragua portrayed in selected official government speeches and works of poetry published by key intellectuals between 1970 and 1990? How do these representations square with or differ from the personal recollections of Nicaraguan citizens today who lived through that era? Through close readings of diverse cultural narratives, I hope to show that

Nicaraguans have configured and refigured events in order to manage and understand the transformations they lived through as individuals and as a nation.

**Strategic and Tactical Decision-Making of the Kurdistan Workers' Party (PKK)***Rebecca P. Lucas '14, Political Science*ADVISOR: *Craig Murphy, Political Science*

Focus on the use of violence by extra-governmental groups is frequently concentrated on outrage; while this may be an appropriate reaction, it causes scholars to neglect the question if its efficacy as a strategic and tactical tool. The Kurdistan Workers' Party (PKK) is one group that has used violence over the last three decades in the pursuit of ethno-nationalist goals. My senior thesis uses historical narrative and statistical analysis to examine the ways in which they have utilized violent tactics and those factors that determine their strategy and tactics over the last three decades, with a particular focus on ideology, public support, civil society, and resources.

**Mixture and Movement in the Indian Ocean World**

(panel discussion) Founders Hall 126

*Mona I. Elminyawi '14, Individual-Urban**Studies, Ashley J. Porras '14, History,**Mariam Saifullah '15, Economics*ADVISORS: *Lidwien Kapteijns, History and Nikhil Rao, History*

Modern historical studies often take the nation-state as the unquestioned unit of study. In this history seminar, Port Cities of the Indian Ocean in Historical Perspective, we destabilized this assumption in order to look at society from the point of view of the coast. We learned about the various elements of unity that constitute the Indian Ocean as its own world and coherent object of study. Among these, mixture and movement was one common element of unity in port city societies. Our research touched upon topics of networked and traveling cultures, diverse communities, cosmopolitanism, and trade relations in the Indian Ocean region. While student research covered the history of cities situated on the littorals of the Red Sea, East Africa, the Persian Gulf, and South Asia, this presentation will focus on the implications of mixture and movement in India and the port of Bombay. We will discuss how Bombay became a major trading port, how a community of Parsi traders became agents of social change in British Bombay, and how the character of this port city influenced religious identity construction.

**Exclusionary Urbanism: Exploring Environmental Injustice in Bangalore**

(exhibition) Jewett Arts Center Art Gallery

*Mayrah W. Udvardi '14, Environmental Studies and Architecture*ADVISOR: *Phyllis McGibbon, Art*

Through these works, I explore the visual components of my senior thesis topic, "Bangalore: Urban Development and Design for the Underclass", which I am pursuing in my Environmental Studies major. Here, I am considering the complex relationship between the natural environment and built infrastructure of Bangalore. I am specifically interested in how historic paradigms of urban development have established and protracted the presence of slums.

**Encore? Encore? Julius Caesar and Romeo and Juliet, Back For One Day Only**

(long performance) Ruth Nagel Jones

Theatre, Alumnae Hall

*Mara E. Palma '15, Political Science,**Catherine A. Piner '16, English*ADVISOR: *Diego Arciniegas, Theatre Studies*

Missed either of The Wellesley College Shakespeare Society's plays this year?

Fear not! Join them as they present scenes and monologues from their fall production of Romeo and Juliet directed by Vanessa Greenleaf. Wondering what the world will look like in 2044? Come and get a glimpse of the future in excerpts from their spring production of Julius Caesar directed by Madeline Furlong.

**Opera: Not So Dead After All**

(long performance) Jewett Arts Center

Auditorium

*Victoria K. Brown '15, Computer Science,**Maria A. Brusco '14, Philosophy and**Economics, Chelsea S. Ennen '14, English and**Theatre Studies, Catherine A. Fromm '16,**Undeclared, Alexa P. Keegan '14, Psychology**and French, Cathleen J. McGovern '16,**Music, Katherine A. Siegel '14, Music,**Sophia P. Sokolowski '16, Psychology and**Biological Sciences, Julia T. Springer '16,**Cognitive & Linguistic Sciences,**Emily K. Weddle '14, Music and Art History*ADVISOR: *Gale Fuller, Music*

Opera combines many different art forms: voice, movement, costuming and fashion, building sets, and learning performance techniques. Representing various composers and operas from the past three centuries we wish to exemplify the relevance of opera in modern times. Within the performance of five operatic scenes we hope to

present the audience with proof that opera was made and continues to be meant for consumption by the masses. Opera is not a dead form of music and, in fact, remains relevant to modern society and can be interpreted in many different fashions. This interdepartmental approach to music allows us to look at the libretto and listen to the pieces, themselves, to thinking about the composer's intentions at the time of composition and the historical relativity of the piece, allowing us to see into the personality of the characters on stage and also add our own instincts to develop the character one step further. Opera: Not So Dead After All.

## Science & Technology

### It's Complex! Complexity in Groups, Networks and Societies

(short talks) Pendleton Hall East 130

#### Structure vs Action: They Study of Quotient Groups in Comparison to Their Action on Hyperbolic Space

Anjali L. Kayal '14, Mathematics

ADVISOR: Stanley Chang, Mathematics

My research studies quotient groups of a non-abelian group, which is similar to studying the result of a corrupted or hacked network. We are studying the quotient groups of a specific type, namely  $Z_2 * Z_3 / N(g)$ . Here  $Z_2 * Z_3$  means the free product group with a generator of order 2 and a generator of order 3 and  $N(g)$  mean the smallest normal subgroup containing  $g$ . Essentially, we are trying to understand these quotients  $Z_2 * Z_3 / N(g)$  through three philosophies: algebraically, graph theoretically, geometrically. The idea is to develop tools to connect these three arenas, so that you can derive results in one realm by information from another.

#### I Saw It on Twitter, But Is It True? Developing a Semi-automated System to Analyze Credibility of Online Information

Margaret A. O'Keefe '16, Computer Science,

Lindsey L. Tang '15, Computer Science,

Susan Tang '15, Computer Science,

Laura D. Zeng '16, Undeclared

ADVISOR: Panagiotis Metaxas, Computer Science

The ubiquity of online social networks has led to an increased reliance on these platforms for real-time information. As more people are relying on social media for news, we recognize the demand for a tool to examine the credibility of unverified information in these

channels. During Summer 2013, we investigated information propagation on Twitter, a popular social network that allows its users to "tweet" statuses to their followers in 140 characters or less. After analyzing historical Twitter data sets and published academic research, we worked on developing a web-based system to track the credibility of a single tweet. Our algorithms collect huge amounts of related tweets, analyze them based on desired keywords, and identify the timeline of information spreading. We also built different interactive graphs to visualize this data, allowing the user to examine the origins of the tweet as well as the independence and trustworthiness of the users who propagate it.

#### Complexity of Index Sets of Various Computable Groups

Abigail J. Raz '14, Mathematics

ADVISOR: Karen Lange, Mathematics

Computability theory is a branch of mathematical logic that explores issues of computation. A set is computable if there is a computer program that determines whether or not any element is in the set. Tools from computability allow us to examine the complexity of given mathematical objects, such as graphs or groups, commonly studied objects in mathematics. We can think of complexity as a measure of how non-computable a given object is. The complexity of the form of a statement needed to describe an object can be used to determine the complexity of the object. I am studying specific groups that can be described in a computable way. The set of these descriptions is called the index set of the group. The main focus of my thesis is determining the complexity of the index sets for groups with various additional properties.

#### What's 'appening

(short talks) Pendleton Hall East 239

#### Improving the Usability of App Inventor through Conversion between Blocks and Text

Karishma Chadha '14, Computer Science

ADVISOR: Franklyn Turbak, Computer Science

In blocks programming environments, users compose programs by combining visual program fragments shaped like jigsaw-puzzle pieces ("blocks"). The shapes suggest how the blocks fit together, eliminating syntactic frustrations experienced by novices when learning textual programming languages. MIT App Inventor, a popular online tool for Android app development, democratizes programming through its easy-to-use blocks language. Though simple blocks programs are easy to read and write, complex ones become overwhelming. Creating and navigating nontrivial blocks programs is

tedious, and App Inventor's current inability to copy blocks between projects inhibits sharing. My thesis addresses these issues by creating a textual language isomorphic to App Inventor's blocks language and a mechanism to convert between them. This project aims to: (1) increase App Inventor's usability by providing an efficient means for reading, constructing, and sharing programs, and (2) ease users' transitions from blocks programming to traditional text programming.

#### Effects of E-Readers on Children's Recall of Mental State and Factual Information: From a Socioeconomic Point of View

Rosa I. Guzman '14, Psychology

ADVISOR: Jennie Pyers, Psychology

Children today grow up surrounded by technology. The term "21st century learning" has become a buzzword, as teachers and parents rush to incorporate technology into their children's daily activities to "enhance" their learning experience. In particular, e-readers (electronic readers) have become a common tool found in classrooms and at home. This study used an experimental design to investigate the effect of e-readers on 3- to 5-year-olds' comprehension of stories, specifically with relation to their recall of factual and mental state information (e.g., emotions, thoughts) in the absence of an adult. The sample of participants included children of low and high socioeconomic status (SES) given children of low SES experience less shared book reading time than their high SES peers and may be affected by e-readers differently. (Research supported by Daniels Fellowship)

#### Improving App Inventor User Debugging Tools

Johanna L. Okerlund '14, Computer Science

ADVISOR: Franklyn Turbak, Computer Science

App Inventor is a visual environment where programs for Android mobile devices are composed out of blocks resembling jigsaw puzzle pieces. Blocks languages like App Inventor lower barriers for novices by eliminating many common programming errors and by providing visual guidance for understanding program structures. There are now about 1.5 million App Inventor users and 3.5 million projects.

My previous work studied the proficiency of App Inventor users by analyzing the structure of their programs and the runtime errors their programs generate. While App Inventor reduces the kinds of errors in user programs, it does not eliminate runtime errors entirely. Preliminary analysis of the users' runtime errors shows that better debugging tools for App Inventor are needed. I am implementing ways for users

to pinpoint the source of runtime errors and improving the collection of runtime error data to track more fine-grained information about how users deal with errors.

### tThe Right Fit App: Find Out What Size You Are in Different Brands!

*Sophia A. Zachares '15, Media Arts & Sciences and Italian Studies*

ADVISOR: *Stella Kakavouli, Computer Science*

Over the summer I interned in the fashion department of Redbook Magazine of the Hearst Corporation. There I worked both in the Fashion closet assisting with “stories” and on the website, creating online “flipbooks” such as trending swimwear, summer dresses, handbags, and fall boots.

During my many projects one of the things that kept coming up was how difficult it was for women to find the right clothing size for them and that in fact many women wear the wrong size without even realizing it. To highlight this, in the October issue of Redbook we worked on a “best fit denim story.” We had 20 women come to the office for a “Denim Bar party” to help them find a good pair of jeans. We assembled 600 pairs of jeans from 20 different brands in sizes 00-24. Even in this situation with so many different sizes and brands available it was difficult for the women to find even two pairs of jeans that fit them well.

Based on this experience, I decided to design and create a mobile phone app to help women find their right size in different brands. It will run on the android platform.

The user is asked to take three measurements of her body (bust, waist, hips) and enter them in the app. Based on these measurements and the sizing information provided by clothing companies, the program decides the right size for her in different clothing brands, and presents the results. The app also gives her the option of setting up an account, where her data will be stored. She can use her login credentials to access that information any time in the future.

In order to make this app, I had to introduce myself to and learn how to use MIT’s app inventor.

In the next few months I plan to extend my application by incorporating source crowding. My plan is to use the working version of this app with Wellesley women, part of the intended audience, to verify my algorithms and the results they produce.

In addition this might prove to be an alternative way of deciding one’s size in different brands, without even the need for taking one’s

measurements. This would make for a much more user-friendly app.

My hope is that this application will make it just a bit easier and faster for women to find clothes that fit them better.

### Biological Chemistry Program Thesis Research Talks (panel discussion) Jewett Arts Center 450

Members of the 2014 Biological Chemistry class will present their thesis research projects, culminating their studies at Wellesley College. Coming from labs both on and off campus, these students will present their ongoing work, ranging from organic synthesis to cancer therapy research.

#### The Effect of a Novel Cytotoxic Agent on the Kinetics of Phosphodiesterase 3A

*Lara N. Gechjian '14, Biological Chemistry*  
ADVISORS: *Didem Vardar-Ulu, Chemistry, Luc de Waal (Broad Institute) and Matthew Meyerson (PI) (Broad Institute)*

Compound 1B is a small molecule with potent anticancer properties. Although the compound is lethal to 4% of cancer cell lines, the reason for its lethality is unknown. This study represents an analysis of the interaction between Compound 1B and its predicted enzyme target, phosphodiesterase 3A. The interaction was analyzed structurally, mechanistically and functionally. Ultimately, the understanding of the effect of Compound 1B on phosphodiesterase 3A will provide insight into the mechanism of its cytotoxicity. Understanding the mechanism of action of Compound 1B in sensitive cell lines is essential for its potential as a treatment for human cancer. (Research support provided by the Schiff Fellowship)

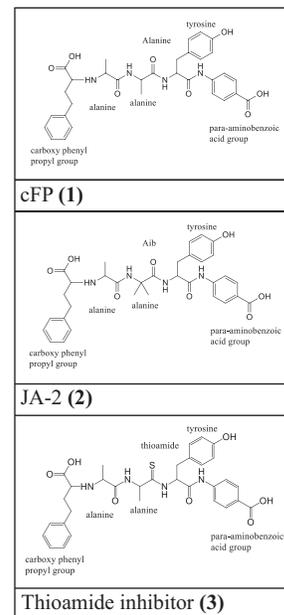
#### Solution Phase Peptide Synthesis of Thioamide TOP Inhibitor

*Melissa M. D'Andrea '14, Biological Chemistry and Spanish*

ADVISOR: *Donald Elmore, Chemistry*

Synthesizing an inhibitor of Thimet Oligopeptidase (TOP) may reveal more of TOP’s function both in vitro and in vivo. A common TOP inhibitor, cFP, (1) is an effective competitive inhibitor of TOP in vitro; however, in vivo, cFP, was hydrolyzed. Thus, cFP was not a viable inhibitor. Another TOP inhibitor, JA-2 (2), was synthesized. JA-2 is non-hydrolyzable in vivo. However, JA-2 resulted in unexpected secondary side effects. Thus, to find out if JA-2 inhibits other proteins besides TOP, another inhibitor must be synthesized.

The goal of this study is to use solution phase peptide synthesis to make a non-hydrolyzable version of cFP (3): changing the oxygen of the second alanine to a sulfur. The thioamide version of the cFP inhibitor is expected to be less susceptible to cleavage in vivo. It is expected that the thiopeptide may be a more specific inhibitor to TOP than JA-2 as well.



**Figure 1.**  
TOP competitive inhibitors.

#### Monoclonal Antibody Targeted Delivery of Boron Loaded Gold Nanoparticles to Pancreatic Cancer Cells for Boron Neutron Capture Therapy

*Sara K. Martin '14, Biological Chemistry*

ADVISOR: *Donald Elmore, Chemistry*

Pancreatic adenocarcinoma is an aggressive disease with an extremely high mortality rate. New therapies are needed to treat this deadly disease. Gold nanoparticles (GNP) are attractive vehicles for cancer therapeutics. The chemistry of gold allows for easy attachment of therapies.

In addition GNPs can also access tumors through the leaky vasculature. Boron Neutron Capture Therapy (BNCT) involves localizing non-toxic and non-radioactive Boron-10 to tumor cells. When a Boron-10 atom is hit with low thermal energy neutrons it decays into destructive high-energy Lithium ions and  $\alpha$  particles. By loading boron onto GNPs the therapeutic delivery to tumors can potentially be increased. The success of BNCT also relies on targeting the boron specifically to the tumor in order to localize damage to the tumor. Through attaching an antibody that recognizes a cell surface protein on pancreatic adenocarcinoma cells to the GNPs the boron can be directed to the tumor. (Research supported by Schiff fellowship).

## Demystifying Science through the Power of Art

(panel discussion) Science Center 396

*Aisha L. M. Bornoe '17, Undeclared, Kelsey B. Burbans '17, Undeclared, Jaclyn N. Burton '17, Undeclared, Clara Cotty '17, Undeclared, Yujing Fan '17, Undeclared, Ceallach B. Gibbons '16, Political Science, Jung Ryun Hong '14, English, Diana Thanh Nguyet Huynh '15, Art History and Political Science, Alexandra S. Kaye '17, Undeclared, Joanna S. Kim '17, Undeclared, Eugene Lee '15, Economics and East Asian Studies, Patricia L. Liu '14, East Asian Studies, Isabel H. C. Noonan '17, Undeclared, Christina S. Pollalis '16, Political Science, Colleen G. Royal, Senior Davis Scholar, Theatre Studies, Katherine A. Schwartz '15, Political Science*

ADVISOR: *Didem Vardar-Ulu, Chemistry*

Most biological molecules on earth are made up of the covalent combinations of the four chemical elements: Carbon, Hydrogen, Oxygen, and Nitrogen. Amino acids are one subset of these biomolecules. They can link together and form long chains that need to fold correctly to make functional proteins, or can be further processed to yield many of the brain chemicals that motivate, sedate, focus or frustrate us. Please join us, as we use multiple forms of art to explain how four of the most talked about neurotransmitters, dopamine, serotonin, adrenalin (epinephrine), and noradrenalin (norepinephrine), are made and how they function in our bodies. We will also share with you the mini-projects we created in the form of visual arts, music, creative writing, and movement that reflect our individual understanding and insight of the intriguing brain protein prion and how it can lead to the different prion diseases when it folds incorrectly.

## Social Sciences

### A Change is Gonna Come

(short talks) Science Center 278

### The History and Perception of Adaptive Sports and the Paralympic Games

*Alexandra K. Azzi '15, American Studies*

ADVISOR: *Jeannine Johnson, Writing Program*

The Paralympic Games are filled with stories of overcoming obstacles, personal sacrifice, and inspiration. But are these the stories that should be told? This fall, I conducted an independent study about the Paralympic movement and set out to examine the perception of disability in the adaptive sports community. I anticipated that I would conduct my study by reading a variety of scholarly materials but quickly learned

that there is a serious lack of academic research on the Paralympic movement. So I did my own research. I conducted over two-dozen interviews and had the opportunity to speak with a wide array of people - from current Paralympians, to sports administrators, to a member of the International Paralympic Committee. Although my Ruhlman talk will focus on my independent study, I will also briefly discuss my internships with NBC Olympics, including during the 2014 Paralympic Winter Games.

### Change-Magazine: Exploring Social Change from a Student's Perspective

*Mary Lou E. Ferguson '16, Economics and English, Genevieve E. Rogers '16, French and English*

ADVISOR: *Habrie Han, Political Science*

Change-Magazine is a new and different kind of student-reporting that explores the online forum as our medium of communication. Change-Magazine originated as a Wellesley & Harvard project in the spring of 2013, and has since expanded to nine different schools (and counting).

The magazine is divided into three sections aiming to provide a comprehensive analytical look at grassroots activism: "Process Analysis," "Issue Awareness," and "Profiles." Change was completely put together by-- and continues to be solely run by-- students. This has provided many exciting challenges to learn from including: coding the entire website, soliciting new writers at our own schools and at others, applying to be a nonprofit organization recognized by the state of Massachusetts, exploring social media platforms, and financing ourselves without college or university assistance which has ranged from working with advertisers, soliciting donations, and planning fundraisers.

### Gender in Social Media: Analysis of Competitive 2012 U.S. Senate Races

*Emily F. Gamber '14 Women's & Gender Studies and American Studies, Alessandra Saluti '16, Political Science and French Cultural Studies*

ADVISOR: *Marion Just, Political Science*

Alessandra and Em are working with Marion Just on an ongoing research project that analyzes social media messages from 2012 US Senatorial Campaigns. Social media has become an increasingly important aspect of both state-level and national campaigns. The 2012 Senatorial races provided many nationally covered races, and a number of split gender races. Previous research has shown that women candidates tend to campaign very similarly to men, but that differences sometimes arise in tone, issue focus

and target audience. Utilizing Twitter, Facebook and YouTube, we are looking to see if gender is an important or relevant variable in the use of these particular platforms. The analysis includes measures of tone, topic, images and also user comments.

### Navigating between the Cultures as Strategic Players: A Sociological Research on Chinese Overseas Students' Customized Self-Presentation on Facebook and Renren

*Xinyue Wu '14, Sociology*

ADVISOR: *Joseph Swingle, Sociology*

This project investigates how Chinese overseas students navigate between cultures by analyzing their self-presentation strategies on Facebook and Renren (a popular Chinese social media site similar to Facebook). Key questions motivating my research were: Can slight changes in website platforms impact social strategies? Do self-presentations project new constructed selves? Are we all social chameleons, shedding off and putting on identities when needed? Students in my study customized different self-images depending on the nationality of their primary audience. Minor differences in website designs, combined with differences in national cultures triggered different patterns of self-presentations. On Renren, the users posted ideological content while on Facebook they posted about their social life. The hoped-for identities of users depended on cultural audience, and the two social media sites facilitated different kinds of self-expression. In addition to a content analysis of social media sites, this project also collected information via online surveys and interviews.

### Mellon Mays Research Imperatives Session One

(panel discussion) Pendleton Hall East 339

### Donor Children: Analyzing the Unique Kinship Networks of Donor Children and Their Perspective on These Relationships

*Nicole L. Blansett '15, Economics*

ADVISORS: *Tracey Cameron, Office of Intercultural Education and Rosanna Hertz, Women's & Gender Studies and Sociology*

Advances in modern technology have not only grown the reproductive technology industry but also raised serious questions about privacy and donor anonymity. In addition to the opportunity to receive information on donors, donor families are now able to connect with other families who have conceived using the same donor, expanding their possible kinship circles. The rapid rate of growth and change in this industry is exciting, but carries with it

two fundamental concerns. The first is a lack of research taking the perspective of donor children. The second is the failure of public policy and legislation to keep pace with the use of reproductive technologies. The solutions to both will have resounding implications on questions as basic as how define family. (Research supported by the Mellon Mays Undergraduate Fellowship)

### **Stronger Communities, Stronger School- The Creation and Evolution of Transformative Partnership**

*Loren S. Cabill '14, Africana Studies*

ADVISORS: *Tracey Cameron, Office of Intercultural Education and Soo Hong, Education*

This project will enhance our understanding of the Wellesley College-St. Stephen's partnership, Stronger Community, Stronger Schools. We will be studying the relevance of critical service learning to college students today and the impact of social change within Boston communities. We will explore what motivates students to join and continuing doing service. We also hope to find how service can inform one's understanding of social justice and their overall career aspirations. (Research supported by the Mellon Mays Undergraduate Fellowship)

### **It's Gotta be the Shoes**

*Chanel Geter '14, Sociology and American Studies*

ADVISORS: *Tracey Cameron, Office of Intercultural Education and Michael Jeffries, American Studies*

In today's society, conspicuous consumption discretely guides almost all of our purchasing decisions, particularly when shopping for attire. For young men, sneaker culture dictates a large majority of their fashion decisions, with entire clothing lines being sculpted from the foundation of a popular gym shoe. For example, the Air Jordans brand has proliferated urban fashion trends ever since its 1989 introduction into popular culture via a commercial entitled "It's Gotta Be the Shoes" starring Michael Jordan and Spike Lee. In my research, I question whether affinity for and identification with the Air Jordans brand (specifically: the Jordan shoe line) can be determined according to racial background and cultural tradition. Attend my 2014 Ruhlman presentation to witness the results! (Research supported by the Mellon Mays Undergraduate Fellowship)

### **Navigating Diaspora: The Trans-Atlantic Slave Trade and the Black Atlantic World through the prints of Willie Cole**

*Imani C. Higginson '14, Art History*

ADVISORS: *Tracey Cameron, Office of Intercultural Education and Nikki Greene, Art*

This inquiry explores the work of contemporary artist Willie Cole. More specifically, it investigates Cole's use of iron scorches, which recall abolitionist woodcuts of slave ships from the 16th century. Cole, however uses these iron scorches more conceptually to create new shapes, as a result questioning notions of domesticity as related to African-American women as well as memory of the Trans-Atlantic slave trade in the 16th to 19th centuries. Findings will analyze, art historian Robert Farris Thompson's *Flash of the Spirit*, which traces the dispersal of West African cosmologies throughout the Americas as a result of slavery as well as Paul Gilroy's *The Black Atlantic*, which seeks to reconcile the liminal space through which Diaspora was created. In connection with these ideas about memory and history, I hope use the texts that Cole may have been reading and is reading as a source of analysis to develop these concepts. (Research supported by the Mellon Mays Undergraduate Fellowship)

### **Perspectives from The Freedom Project I: Libertarian Themes**

(panel discussion) [Science Center 277](#)

#### **Bitcoin: The Capitalist Libertarian Ideal?**

*Victoria M. Hills '14, History and Biological Sciences*

ADVISOR: *Thomas Cushman, Sociology*

By the time he was finally arrested in the fall of 2013, the 20-something owner of Silk Road -- "the eBay for drugs" -- had amassed a multi-million-dollar fortune in black market money. Why did it take the FBI so long to shut down the highly illicit drug-dealing website? The site's transactions were made exclusively with bitcoin, a digital currency whose unmoderated, unlegislated nature makes it extremely difficult to trace. Because bitcoin transactions are made directly between individuals with no third-party interventions or oversight, especially not by banks or governments, some hail the currency as a libertarian ideal. Using bitcoin as a case study, we will examine the benefits and deficits of libertarianism. Is bitcoin, and libertarianism, "good" for the individual? Is it good for society?

### **Anarcho-Capitalism and the Preservation of Liberty in a Free Society**

*Evana Nabi '17, Undeclared*

ADVISOR: *Thomas Cushman, Sociology*

Two powerful, wealth amassing institutions -- government and capitalist enterprise -- are viewed differently by the general public. The conventional liberal view often regards government as the promoter of the common interest, while capitalist enterprise is regarded as a promoter of selfishness and self-interest. This is a false dichotomy, usually based on a lack of understanding of the public goods that come from free-enterprise and a lack of knowledge about the limitations of democracy. I argue that anarcho-capitalism is a better protector of liberty than democracy and raise some central questions about how anarcho-capitalist principles might actually function in modern society. Do anarchists oppose all leadership and laws or simply a monopoly on the state's use of force? How can a society without a government care for those in need of protection and aid? How is justice served for those who commit crimes?

### **The Fine Line between National Security and Civil Liberties: National Opinion Before and After 9/11**

*Zhou Wang '16, Biological Sciences*

ADVISOR: *Thomas Cushman, Sociology*

Benjamin Franklin once wrote: "Those who would give up essential liberty, to purchase a little temporary safety, deserve neither liberty nor safety". In our modern era when technology and rapid advancements of national security techniques are available, the solid line that Franklin drew between national security and civil liberties are undeniably blurred in an age of Terrorism and Technology. After the devastating 9/11 attacks, US citizens were faced with numerous dilemmas regarding rights versus the needs of the national security state. After the leaks made by whistleblower Edward Snowden about the National Security Administration's methods of collecting data on everyday Americans, these dilemmas have only intensified. This talk explores the evolution of public opinion on surveillance programs before and after 9/11, and considers the role of whistleblowers in curbing the power of the administrative state in American society.

### Perspectives from the Freedom Project II: The Problem of International Prostitution

(panel discussion) Science Center 104

*Tiffany Chung '17, Undeclared, Adela Curtin '17, Undeclared, Marilis Dugas '16, Political Science, Hailey Webster '17, Middle Eastern Studies*  
 ADVISOR: *Thomas Cushman, Sociology*

In the course of the Freedom Project Wintersession Seminar at Wellesley, we were exposed to provocative interpretations of freedom and liberty as they relate to current domestic and international issues. Our panel focuses on international prostitution, an ongoing multilateral issue facing the world today, and how it relates to classical liberal concepts of freedom. Using the case study of the European Union as a microcosm for the world, we attempt to understand the effect of open borders on the legalization of prostitution. We will not attempt to judge the morality or “rightness” of legalizing prostitution: this is merely a thought experiment as to the consequences, domestic and international, of global legalization of prostitution. We will discuss themes of domestic regulation and corruption, global open borders as a measure of legalizing prostitution, and the role of international institutions in dealing with an issue that clearly transcends individual nation-states.

### Wintersession 2014: Healthworks Community Fitness and Women's Empowerment

(panel discussion) Pendleton Hall West 212

*Sarah E. Carlson '17, Undeclared, Sang Hyun Kim '17, (Babson), Mitchell McKinnon '14, (Babson), Dai Trang Nguyen Phan '16, Economics, Alyssa Reisner '17 (Babson), Taelyr Roberts '15 (Babson), Wendy Sachs '15, (Babson), Amy N. Wickett '16, Economics, Michélene Wilkerson '16, (Babson), Suh H. Yoon '15, Religion, Janna Zimmerman '14, Environmental Studies*

ADVISOR: *Theodore Ducas, Physics*

Healthworks Community Fitness (HCF) is a non-profit organization operating two full-service fitness centers in Dorchester, MA. HCF is dedicated to promoting the health and empowerment of minority women and children who live in a neighborhood characterized by people with limited economic resources. Our 10-student team worked with feedback from

staff at the center to expand its options for care and access for more people. We focused on marketing and branding to assist them in their fundraising, as well as refining the existing data management system to be more intuitive and comprehensive. In addition, we created a database of potential partners/donors and volunteers, including ourselves and our schools, who share HCF's belief that all women deserve access to high-quality fitness opportunities and health support. (Funded by the BOW Three College Collaborative)

### Humanities

#### Heroes, Bulls, Keats and Woolf (short talks) Jewett Arts Center 450

##### Travels With Virginia Woolf

*Ava C. Bramson '14, English*

ADVISOR: *Lisa Rodensky, English*

Experiencing Virginia Woolf throughout four years at Wellesley-- a retrospective. Supported by the Pamela Daniels '59 Fellowship.

##### Identity Unthroned: Fallen Sublimity in Keats' Hyperion, Shakespeare's King Lear, and Milton's Paradise Lost

*Sydney S. Cusack '14, English*

ADVISOR: *Alison Hickey, English*

The works of Keats, Shakespeare and Milton all contain figures fallen from power and grace: Saturn in Hyperion, Lear in King Lear, and Satan in Paradise Lost. After the fall, what remains? In this talk, I intend to examine the aftermath of each character's fall from power, including what happens to his sublimity, the dissonance (or concord) between his self-perception and his perception by others, and the consequences of shifts in the locus of his power. Despite their different circumstances, Saturn, Lear, and Satan have much in common as fallen powers, their unthroned identities lost, “somewhere between the throne, and where [they] sit” at present.

##### Heroes by Another Road: Robin Hood and The Cid

*Sara D. Del Balzo '14, Spanish and Medieval/Renaissance Studies*

ADVISOR: *Elena Gascon-Vera, Spanish*

Thieves and mercenaries are not typical inspiration for national identity, and yet in England and Spain, two such figures have been elevated through the passage of time to the position of national hero. Robin Hood, as most of us know, is traditionally known as an outlaw who hides in the forest and steals from rich passerby. The Cid is known as a champion of Christian values, though the real man was willing to fight for both Christians and Muslims alike. For my senior thesis, I chose to compare these two figures in an attempt to see what makes a national hero, and how the legends surrounding these two men have changed in order to allow them to remain sources of national identity and pride.

### Bullfighting in Ernest Hemingway's Fiction and Nonfiction

Stephanie L. Gall '14, *English and Neuroscience*  
 ADVISOR: William Cain, *English*

Ernest Hemingway described, examined, and returned to bullfighting in his life and work throughout his career, generating numerous journal articles, short stories, a novel and two nonfiction books on the subject. In his work, the bullfight serves as a microcosm for his exploration of tragedy, honor and artistry. His final piece of nonfiction, *The Dangerous Summer* (1985), chronicles the rivalry of the Spanish matadors Antonio Ordóñez and Luis Miguel Dominguín during the summer of 1959. Scribner published the book posthumously, severely editing it. The published version of this text thus represents less than half of the original typescript. The typescript reveals considerably more of Hemingway's psychology, thoughts and feelings, than Scribner's edition. As he seeks especially to experience and depict bullfighting from the matador's perspective, Hemingway broadens his conception of its tragedy to include the painful decline of the bull and man. (Research supported by JFK Library and Wellesley College)

## Science & Technology

### Growing Out of My Genes

(short talks) Pendleton Hall West 212

#### Appendage Remodeling During Metamorphosis and Growth Regeneration is Regulated by Hedgehog Signaling Activity in the Flour Beetle, *Tribolium castaneum*.

Karin Darakananda '14, *Biological Sciences*  
 ADVISOR: Yuichiro Suzuki, *Biological Sciences*

A key innovation in insect evolution is complete metamorphosis, which is characterized by the development of specialized larval appendages. To gain insights into the origins of these larval appendages, the role of Hedgehog (Hh) signaling during regeneration and metamorphosis was examined. Using the red flour beetle, *Tribolium castaneum*, Hh signaling was silenced to determine its effects on cell proliferation. Downregulation of Hh resulted in disrupted cell proliferation during metamorphosis and inhibition of tissue growth during regeneration. In addition, interruption of Patched and Costal, which act as antagonists of the Hh signaling pathway, led to larval limb tissue overgrowth. Since Hh is not required for regenerative growth in insects that do not undergo complete metamorphosis, Hh appears to play a distinct

role in larval limb regeneration. Our findings further indicate that Hh plays a major role in regulating growth and morphogenesis of larval appendages.

#### Regulation of Critical Weight in the Tobacco Hornworm, *Manduca sexta*

Nicole E. Hatem '14, *Biological Sciences*  
 ADVISOR: Yuichiro Suzuki, *Biological Sciences*

*Manduca sexta*, or the Tobacco Hornworm, goes through five molts before becoming a pupa. The pupal molt is marked by a drop in Juvenile Hormone (JH) in the hemolymph. JH levels decrease in the hemolymph once the caterpillar reaches a particular body size. If JH is removed from the animal, the larvae pupate at a much smaller body size as long as their diet contains amino acids. Because amino acids activate the Target of Rapamycin (TOR) signaling pathway, it was hypothesized that TOR signaling might regulate the timing of pupation in larvae that have no JH. Inhibiting TOR signaling in black mutant *Manduca sexta* that naturally have less JH produced significantly larger animals. Further analysis of the prothoracic gland size compared to growth rate shows that without JH pupal molts may be analogous to larval molts. (Research supported by a grant from the National Science Foundation)

#### Investigating the Role of Vvl in the Regulation of the Initiation of Metamorphosis

Amy Ko '14, *Biological Sciences*  
 ADVISOR: Yuichiro Suzuki, *Biological Sciences*

Metamorphosis and puberty are characterized by dramatic morphological and behavioral changes, and their regulation remains a puzzling scientific enigma. In insects, the timing of metamorphosis is regulated by the interaction between juvenile hormone (JH) and ecdysteroids. My research focuses on how the POU transcription factor Ventral vein lacking (Vvl) plays an important role in regulating the onset of metamorphosis. Silencing Vvl expression using RNAi interference (RNAi) resulted in the induction of precocious metamorphosis in *Tribolium castaneum* and a reduction in the expression of the JH-inducible gene *kruppel* homolog 1 (*kr-h1*). In addition to inducing precocious metamorphosis, molting was also inhibited in vvl RNAi animals. Since molting is regulated by ecdysteroids, the activity of ecdysteroid signaling pathway was examined in vvl knockdown animals. Thus, I looked at how vvl influences both JH and ecdysone signaling and biosynthesis, potentially acting as an integrator of both hormonal pathways to regulate the metamorphic onset.

### Population Genetics of the Shortfin Mako Shark (*Isurus oxyrinchus*)

Melaina A. Wright '15, *Biological Sciences*  
 ADVISOR: Jocelyne Dolce, *Biological Sciences*

The shortfin mako shark (*Isurus oxyrinchus*) is listed as a highly migratory species under the 1995 United Nations Agreement on the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA). Because of its migratory status, information regarding the population genetic structure of *I. oxyrinchus* is useful in identifying distinct population segments that can be managed regionally apart from the global population. However, previous studies on *I. oxyrinchus* have yielded conflicting results regarding the presence of genetic population substructure within this species. Therefore, I conducted an experiment with the aim of assessing the population genetic structure of *I. oxyrinchus* both globally and regionally. This was accomplished by analyzing mtCO1 gene sequences and by performing RAD (Restriction Site Associated DNA) sequencing on North Carolinian *I. oxyrinchus* samples, making this the first study to perform RAD sequencing on a shark species. (Research supported by a NSF funded REU program)

### Progress Towards the Synthesis of Novel Therapeutic Anticancer Agents and a Gold Nanoparticle

(panel discussion) Pendleton Hall West 117

Alyssa F. Bacay '14, *Biological Chemistry*,  
 Christine H. Chun '15, *Chemistry*,  
 Katherine W. Eyring '14, *Neuroscience*,  
 Maria Jun '14, *Chemistry*, Kellen M. Kartub  
 '14, *Chemistry*, Emily S. Lee '16, *Biological Chemistry*,  
 Hong Zhang '15, *Chemistry*  
 ADVISOR: Dona Carrico-Moniz, *Chemistry*

Research collaborators: Andrew Webb, Biological Sciences and Nolan Flynn, Chemistry  
 The Carrico-Moniz laboratory seeks to develop novel anticancer therapies through the synthesis and biological evaluation of novel organic compounds. Herein, we report on progress towards three ongoing research goals: the synthesis of two natural products and structurally related compounds with intrinsic cytotoxicity against ovarian and pancreatic cancer cell lines, and an organic molecular scaffold for the assembly of gold nanoparticles. Recently, our laboratory published a novel asymmetric method towards the synthesis of Spiroxin A, a natural product with promising activity against ovarian cancer. Current work in our laboratory is focused on testing the versatility of this method. In addition, we are investigating the bioactivity of

simplified coumarin derivatives (inspired by the natural product Angelmarin) against pancreatic cancer cell lines. Concurrent with biological studies, spectroscopic investigations to probe the underlying mechanisms of cytotoxicity are currently underway. Lastly, we are working towards the synthesis of a soluble, organic scaffold for the electrochemical assembly of gold nanoparticles that can be used for the delivery of therapeutic cancer agents.

**MolecularMatch.com:  
Barnase + Barstar 4ever**  
(panel discussion) Founders Hall 120

*Jacquelyn E. Blum '14, Chemistry, Connie Chen '15, Mathematics and English, Daniele Evangelista Leite da Silva '14, Chemistry, Helena W. Qi '14, Chemistry and Physics, Aiman Sherani '15, Physics, Chemistry and East Asian Studies*

ADVISOR: *Mala Radhakrishnan, Chemistry*

Having problems with commitment? Proteins do too. Our lab tries to help proteins find their perfect matches. Using computational techniques, the Radhakrishnan lab studies the electrostatic determinants of binding in biological systems. Our projects focus on developing and improving methods of modeling electrostatic interaction and probing the structural characteristics important to binding. Results of our studies can be used to improve drugs, and increase the efficiency of binding free energy calculations. Overall, we hope that our work can provide insights into molecular binding -- and help with the love/hate relationships between proteins. (Research supported by the Roberta Day Staley and Karl A. Staley Fund for Cancer-Related Research)

**Making Wellesley College  
a LEEDer: Illuminating the  
Holistic Benefits of Sustainable  
Building Design**

(panel discussion) Science Center 277

*Leigh S. Barton '14, Environmental Studies, Traci A. Hamanaka '14, Environmental Studies, Sophia Liu '14, Environmental Studies, Nicole A. Lobodzinski '14, Spanish and Environmental Studies, Jenny R. Mittleman '14, Environmental Studies, Mayrah W. Udvardi '14, Environmental Studies and Architecture*

ADVISOR: *Monica Higgins, Environmental Studies*

Wellesley celebrates a rich history and traditions that are inextricably linked with the aesthetical landscape. Today, the college must balance these values while addressing evident shortcomings in the capacity and functionality of its campus.

On the eve of a major campus renovation, the Environmental Studies capstone class will present sustainability-minded design frameworks that align with the greater goals of the college. By examining the strategies of peer institutions, consulting with diverse stakeholders, and performing quantitative analysis, we have developed building guidelines that could transform Wellesley into a leading sustainable institution and community. The ideas we suggest seek to modernize Wellesley while preserving its identity, as well as help shape future spaces so that they are as reflective as the conversations that will occur within them. Come learn the nuts and bolts of holistic building design and how it could transform our campus over the next decade.

**Engineering for Humanity:  
Helping Elders Age in Place  
through Partnerships for  
Healthy Living**

(panel discussion) Science Center 104

*Mafalda Borges '17 (Olin), Naomi Dudley '15 (Olin), Susie Grimshaw '17 (Olin), Zach Homans '15 (Olin), Anders Johnson '17 (Olin), Aditi Joshi '17 (Olin), Maire Keene '17 (Olin), Meg McCauley '17 (Olin), Michael Ninh '15 (Babson), Halley Pollock-Muskin '17 (Olin), Toni Saylor '17 (Olin), Celine Ta '17 (Olin), Meghan Tighe '17 (Olin), Jenny Vaccaro '17 (Olin), Sarah Walters '17 (Olin), Jiaying Wei '17 (Olin), David Zhu '16 (Olin), Hajin Youn '15 (KAIST, Korea)*

ADVISOR: *Caitrin Lynch, Anthropology (Olin)*

Engineering for Humanity, an interdisciplinary engineering design and anthropology course, is a semester-long partnership between Three-College students and the Natick Council on Aging. Older community members were recruited to partner with students in a series of discovery, design, and community-building activities. Come hear Babson and Olin students present results of the empathetic design process. During the semester, students and their elder partners engaged in activities designed to create community and understanding. Next, students synthesized what they learned into project ideas, refining briefs into robust, targeted, and manageable projects through consultation with experts and co-design with elder partners. A series of standard design stages -- specification, prototyping, testing, refinement -- was accompanied by visits with partners for feedback and continued learning and community building. Shortly after the Ruhlman conference, partners will receive custom-designed artifacts intended to solve particular problems. (This Olin College class is supported by the Metrowest Health Foundation.)

**The Power of Protons: Solving  
Biomedical Problems Using  
Magnetic Resonance Imaging**  
(panel discussion) Pendleton Hall West 116

The Wellesley College MRI Lab has focused on three projects this year: 1) We are synthesizing silica-coated nanoparticles for the non-invasive magnetic resonance imaging (MRI) and targeted treatment of pancreatic cancer. 2) We use MRI, MR spectroscopy, and Diffusion Tensor Imaging (DTI) to examine the GCPII/AAV genetic and epigenetic mouse model of schizophrenia and evaluate whether the mice exhibit neurological and behavioral changes that mimic the disorder in schizophrenic patients. 3) We study the auditory system of songbirds, a model for language acquisition, learning, and memory in humans, using blood oxygen level dependent (BOLD) fMRI.

**Assessing a GCPII/AAV Genetic  
and Epigenetic Mouse Model of  
Schizophrenia**

*Tamara Biary '15, Chemistry*

ADVISOR: *Nancy H. Kolodny, Chemistry*

Schizophrenia is a chronic brain disorder that leads to abnormal behavior, cognition and sociability. Although the exact cause of the disorder is still unknown, its onset has been linked to various environmental, genetic, and epigenetic factors. Our study explores a genetic and epigenetic mouse model of schizophrenia, by examining GCPII/AAV-modified mice. This model begins with a genetic mutation thought to be implicated in the aberrant expression of the neurotransmitter glutamate, which is hypothesized to be associated with schizophrenia in humans. We then introduce a virus, AAV, into newborn mice. This virus suppresses gene expression, resulting in epigenetic dysregulation. Our model examines whether mice with the GCPII/AAV mutation exhibit neurological and behavioral changes that mimic schizophrenia in humans. We examine the animals using magnetic Resonance Imaging (MRI), Magnetic Resonance Spectroscopy (MRS) and Diffusion Tensor Imaging (DTI) to determine the structural and chemical changes in the brain. (Research supported by Wellesley College, the George and Adelaide McCague Keller Science Fund, and the Roberta Dey Staley and Karl A. Staley Fund for Cancer-Related Research)

### Functional MRI for Vocal Learning and Memory in the Zebra Finch Model

*Asha Albuquerque '14, English and Cognitive & Linguistic Sciences, Stela P. Petkova '16, Neuroscience, Sarah K. Zemlok '14, Chemistry,*  
ADVISORS: *Sharon Gobes, Neuroscience and Nancy H. Kolodny, Chemistry*

Songbirds, such as zebra finches (*Taeniopygia guttata*), serve as a useful cognitive model for studying human language acquisition, learning and memory, because of their many developmental, genetic and anatomical similarities with humans. Unlike other methods, functional magnetic resonance imaging (fMRI) non-invasively collects information from the whole brain in real time, with regional specificity. While our project goal is to conduct auditory studies on zebra finches, our current work focuses on optimizing sound delivery to the birds and utilizing statistical parametric mapping to establish data analysis methodology.

### Homing in on Personalized Medicine: Building Multifunctional Iron Oxide Nanoparticles for Targeted Imaging and Treatment of Pancreatic Cancer

*Raji R. Nagalla '14, Biological Chemistry*  
ADVISORS: *Nancy H. Kolodny, Chemistry, Nolan T. Flynn, Chemistry and Andrew C. Webb, Biological Sciences*

Diagnosis and treatment of pancreatic cancer remains a challenge in the biomedical community. While one of the rarest forms of cancer, this disease is the fourth most deadly. Our research addresses the need for innovative therapies by building multifunctional silica-coated iron-oxide nanoparticles (NPs), each about 1/1000 the width of a human hair, to selectively image and treat pancreatic tumors. A teaspoon of these particles contains the surface area of Wellesley's academic quad, providing "real estate" to attach large quantities of chemotherapy as well as targeting components to direct the therapy to cancerous tissue. We evaluate the detection of the iron oxide NP cores as a potential tracking and diagnostic tool using Magnetic Resonance Imaging (MRI). Recently, we have explored attaching multiple components to the silica surface of the NPs and testing their targeting capabilities towards cancerous cells using fluorescent confocal microscopy. (Research supported by the National Institutes of Health (NIH)).

## Social Sciences

### Uncovering What We Try Not To See

(short talks) Founders Hall 126

#### Uncovering Sexual Violence and Harassment in U.S. Schools

*Gabriella M. Andriulli '14, French and Women's & Gender Studies*

ADVISOR: *Nan Stein, Wellesley Centers for Women*

As the Linda Coyne Lloyd Research Fellow at the Wellesley Centers for Women, I have been conducting research on sexual violence and harassment in school age children and teenagers in the U.S. My advisor (senior researcher Nan Stein) and I are currently working on a paper for publication in which we illuminate the different gendered aspects of sexual harassment/violence using a variety of incidents from the past few years that have occurred throughout the U.S. We are interested in the ways in which institutions such as the schools themselves, the media (including both traditional and non-traditional forms of journalism), and the criminal justice system handle this often ignored form of violence. It is our goal to highlight possible pathways to justice and critique existing approaches to the gendered harassment and violence in U.S. schools.

#### The Dialectical Method in International Human Rights Practice

*Adeline S. Lee '16, Undeclared*

ADVISOR: *Thomas Cushman, Sociology*

Human rights work tends to be viewed as overwhelmingly good—linked to global development and the protection of vulnerable human beings from depravity, illness, and suffering. Such thinking may actually work to foster the view that aid is intrinsically moral: with good intentions and strong convictions, individuals can definitively end human suffering by enthusiastically propelling themselves into action. This progressive view is uplifting, yet often ignores the unintended consequences and moral dilemmas that well-intended actions often cause. I propose a dialectical method for human rights theory and practice that addresses the tensions between central polarities in the field: help vs. harm, universalism vs. relativism, and positive vs. negative rights. This method offers a more refined capacity to constructively negotiate between diametrically opposed ideas and discover thoughtful, efficient solutions to disturbing problems.

### "That the World May Know:" The Responsibilities and Challenges of War Journalism

*Mariana Zepeda '14, English and Creative Writing History*

ADVISOR: *Lidwien Kapteijns, History*

"In the noisy years of my twenties, I had become fascinated with all that was wrong with the world," writes Aidan Hartley, a Reuters war correspondent who covered Africa during the 1990s. In his memoir, *The Zanzibar Chest*, Hartley reflects on his experiences as a war journalist, examining the ethical dimensions of the job. War journalists like Hartley have the skills, experience, and contacts to get a story out. Yet they are often passing observers with limited understanding of the historical underpinnings of a conflict. My research project examines how a number of well-known war journalists, including Hartley, Anne Nivat, and David Rieff, come to terms with their own roles within conflict and reflect on the question of what makes for effective war journalism.

### Politics of Language

(short talks) Science Center 278

#### Accent Acquisition: Jamaican Creole Speakers' Pronunciation of Standard American English

*Emily F. Anderson '14, Cognitive & Linguistic Sciences*

ADVISOR: *Angela Carpenter, Cognitive & Linguistic Sciences*

When speakers of one dialect are exposed to another, they acquire features of the new dialect and modify their existing dialect. This phenomenon of dialect change is common, but has not been widely researched. Jamaican Creole, known also as Patwa, is spoken to some extent by the majority of Jamaicans and has a close linguistic relationship with English due to its historical formation. Through interviews with Jamaican immigrants, including elicitation of target words and free-speech samples, this study examines how Jamaican immigrants who spoke/speak Patwa have adapted the phonology of their dialect to reflect that of Standard American English. This study hypothesizes that speakers will demonstrate phonological shifts in some aspects of their dialect, and that the degree of change will vary based on length of residency in the U.S., current Patwa use, and socioeconomic status. (This thesis research has been made possible by a Jerome A. Schiff Fellowship.)

### Nationalism and the Centralization of Language: A Comparative Study of France and China

*Susan D. Puente-Matos '14, French and Chinese Language & Literature*

ADVISOR: *Shiao Wei Tham, East Asian Languages & Cultures*

Language reform and nationalist movements are intrinsically linked: The May 4th movement in China was accompanied by demands for a nation-wide written vernacular form, and in France the 1789 revolution was followed by the promotion of the French language to instill a nation-state ideology across the country. Analyzing the various aspects of the two nations' language reform policies will shed light on the ways in which centralizing language has shaped the nations' current identities.

### The Os Impurum in Inveictive Language in Ancient Rome

*Rebecca R. Straley '14, Political Science and Classical Civilization*

ADVISOR: *Elizabeth Young, Classical Studies*

My research focuses on attacks of the os impurum in poems by Catullus. Accusing an individual in ancient Rome of having an impure mouth is one of the most effective ways to question their masculinity. Catullus asserts his own masculinity through sexualized language with a distinct focus on mouth. Despite these hyper-masculine poems, Catullus also wrote less sexually obscene poetry about romance that was considered effeminate by his contemporaries. This dichotomy of the hyper-masculine and effeminate complicates conceptions of Roman sexuality. My research ultimately focuses on Catullus's work to analyze the complex conception of masculinity in ancient Rome.

### To Give Or To Take? That is the Question

(short talks) Pendleton Hall East 239

### How Moral Outcome Contributes to Sharing Behavior in Children

*Mika F. Asaba '14, Neuroscience*

ADVISOR: *Rebecca Saxe, Brain and Cognitive Sciences (MIT)*

We examined the possibility that children are motivated to preserve a congruent representation of "the self" and act in accordance with that representation. If children act in an inconsistent manner, even on accident, they might feel inclined to redeem themselves through future actions. Four-, five-, and six-year olds were asked to perform a neutral action, after which either

a good, bad, or neutral outcome was revealed. Participants were then asked to explain why they performed the action. Prosocial behavior was measured by allowing participants to allocate resources to a puppet. We analyzed if the valence of an outcome played a role in 1) explanation of the cause of the event, and 2) subsequent sharing behavior. Preliminary results indicate that children who experienced a bad outcome were more likely to blame the experimenter for the negative event and share more than children in the good or neutral outcome conditions. These findings suggest that children are motivated to protect their self-concept through compensating for a prior negative outcome with subsequent prosocial behavior (Research supported by Simons Center for the Social Brain funding).

### Altruism: A Natural Thought History of an Idea

*Caroline J. Golub '14, Sociology and English*

ADVISOR: *Jonathan Imber, Sociology*

What is altruism? It is a term most people have heard of, achieving the rare feat of academic jargon converted to popular vocabulary. But even so, there are a myriad of different interpretations of the word. It seems that everyone has a sense of what it means, rather than a distinct, unifying definition. So how do we understand a word fully, a word that has come to mean so much for so many different disciplines? The answer is to start at its conception. By locating the origin of the word altruism, we can begin to track its movement through history, through intellectual texts and ideas, along the diverging fault lines of different disciplines, up until the present, where it has come to represent so many different things. How has altruism come to be, as we see and understand it now? The purpose of this thesis study is to find out.

### To Give and Not to Take: The Influence of Institutions and Framing on Behavior in the Public Goods Game

*Prerana Nanda '14, Economics*

ADVISOR: *Olga Shurchkov, Economics*

A strong cooperative culture, where individuals contribute to social causes and refrain from selfishly overusing existing common resources, is central to the well-being of any society. However, the degree of cooperation and the enforcement mechanisms in place to sustain cooperative behaviors vary dramatically across countries. My senior thesis investigates the impact of institutions on social cooperation. Furthermore, I explore the way in which the framing of a

decision interacts with institutional norms to result in different levels of cooperation. I run a controlled laboratory experiment in which participants are randomly exposed to either a "strong" or "weak" institutional environment and then asked to decide between a socially optimal action and an action that maximizes their individual payoff at the expense of others. Using this data, I consider how understanding the factors contributing to the development of cultural norms and behavioral nudges could be used to promote cooperation. (Research supported by a Wellesley College Faculty Award Grant, Olga Shurchkov)

### Mellon Mays Research Imperatives Session Two (panel discussion) Science Center 396

### A Review of the Effects of Mercury Bioaccumulation and Biomagnification in Baikal Seal (*Pusa sibirica*)

*Diana Lee '15, Geosciences*

ADVISORS: *Tracy Cameron, Office of Intercultural Education and Marianne Moore, Biological Sciences*

Lake Baikal is the largest and deepest lake in the world. It is the home to world's only freshwater seal, *Phoca sibirica*. Although located in a remote part of Russia, this unique lake and its inhabitants face possible environmental threat in the form of mercury contamination. Mercury concentrations in Lake Baikal are lower than mercury concentrations of other lakes. Likewise, the average mercury content in the Baikal seal is also lower than the average mercury content in other seals, such as the Caspian seal (*Pusa caspica*). The purpose of this research inquiry was to explore factors that make the Baikal seal more vulnerable to mercury contamination, especially as the atmospheric temperature rises due to climate change. Join me for this session to hear more about my findings. (Research supported by the Mellon Mays Undergraduate Fellowship)

### The Interlocking Relationship of Race and Discrimination among African Indians in South Asia

*Fiona Almeida '15, Anthropology and*

*Maria Taha '14, Peace & Justice Studies*

ADVISORS: *Tracy Cameron, Office of Intercultural Education and Pashington Obeng, Africana Studies*

Many scholars have researched the Trans-Atlantic Slave Trade to the Americas which gave rise to the dispersal of Africans from continental Africa. The African Diaspora includes

the voluntary and involuntary migration of Africans throughout history. However, there are still missing pieces to the history of the African Diaspora. This research focuses on the interlocking relationship of ethnicity/race and discrimination among Siddis (African Indian) in South Asia. It complicates and challenges the Atlantic Diaspora model to create a broader and more comprehensive understanding of different African Diasporas. This analysis promises to fill a major gap in how Diasporic Africans create new knowledge and survival strategies in their host societies. During the summer of 2013, Almeida spent several weeks in Siddi villages in rural Karnataka, India conducting interviews with the women and observing political and socio-economic injustices Siddi communities face because of their physical appearances and the caste hierarchy of India. (Research supported by Mellon Mays the Undergraduate Fellowship)

### **Consider the Lily: Female Authors Re-Appropriating the 'The Feminine' from the Middle Ages to the Present**

*Thai Matthews '14, English*

ADVISORS: *Tracy Cameron, Office of Intercultural Education and Paul Fisher, American Studies and English*

The essence of scholarship is perhaps best captured in the innovative ways scholars seek to connect varying branches of research. By studying Medieval courtly love, contrasting Victorian heroines to their Byronic heroes, and investigating the legacy of 2nd wave feminism as it has been accepted or rejected in recent YA fiction, the common thread among these different literatures proves itself to be a study of 'the female' as she has been perceived and portrayed in terms of traditional, patriarchal, and heteronormative definitions of maleness. The female as not-male, possessing no inherent identity that can be separated from the absence of masculinity, is a societal paradigm that female authors from Marie de France to Stephenie Meyer have grappled with, each author a study of her times and each female protagonist a symbol of the work that remains to be done by scholars in terms of redefining perceptions of women's fiction. (Research supported by the Mellon Mays Undergraduate Fellowship)

### **The Re-Use of Public Space in Medieval Cairo**

*Michelle Al-Ferzly '14, Art History*

ADVISORS: *Lamia Balafrej, Art and Tracy Cameron, Office of Intercultural Education*

This inquiry focuses on the ways in which public space is understood in the context of the medieval Islamic city, Cairo. Bayn al-Qasrayn, or "Between the Two Palaces", a former parading ground and major thoroughfare initially constructed in 10th century Egypt, presents an intriguing example of the re-use and reconfiguration of a public square in light of the dynastic succession which occurs within the Egyptian capital between the 10th and the 13th centuries. The consideration of Bayn al-Qasrayn as "public", therefore, is vastly affected by the issues of political ideology and the importance of political ceremony to the imperial elite. (Research supported by the Mellon Mays Undergraduate Fellowship)

### **At Home and at Large: How Culture Affects Self-Esteem (panel discussion) Pendleton Hall East 139**

#### **Beauty Today: The Impact of Perceived Sociocultural Pressures and Acculturation on Body Image**

*Carrie J. Perna '14, Psychology,*

*Nikita K. Sedani '14, Psychology*

ADVISOR: *Sally Theran, Psychology*

Culture plays an important role in shaping body image, as people from different cultures have varying opinions as to what is considered the ideal body type. The study examined the influence of acculturation and perceived sociocultural pressure on body esteem and body dissatisfaction among 213 undergraduate women of Asian, Asian American, Caucasian, Hispanic/Latina, and Black descent. Data was gathered through an online survey and results indicated that acculturation into American society along with sociocultural pressure affect the body images of women differently depending on their ethnicity. As acculturation increased, Asian American women experienced lower rates of body dissatisfaction whereas Asian women reported lower overall body esteem. Additionally, Hispanic/Latina women had the highest levels of body dissatisfaction compared to women of other ethnicities. The results of this study have societal implications for understanding how media and culture can change the way the female figure is viewed throughout the world

### **Helicopter Parenting and the Effect on Emotional Well-being of College-aged Students**

*Katherine E. Limoncelli '14, Psychology,*

*Sarah S. Roundy '14, Psychology,*

*Zoe W. Sobel '14, Psychology*

ADVISOR: *Sally Theran, Psychology*

The current study investigated the effects of helicopter parenting on college students' emotional well-being and the moderating roles of ethnicity and parental narcissism. We hypothesized that helicopter parenting would correlate positively with anxiety and depression and negatively with self-esteem, autonomy, and competence. We further hypothesized that students of Asian descent would experience the highest levels of helicopter parenting compared to other racial groups, and that parental maladaptive covert narcissism would be a significant predictor of helicopter parenting. Correlational data analyses revealed that mothers demonstrated significantly higher levels of helicopter parenting than fathers. Mothers' helicopter parenting behaviors were related to increased depressive symptoms and decreased self-esteem, autonomy, and competence in students. Fathers' helicopter parenting behaviors were associated with decreased self-esteem and autonomy. The findings provide insight into the negative outcomes related to helicopter parenting and can help academic institutions protect the mental health of students transitioning through their college years.