

LETTER OF WELCOME

April 6, 2011

Dear Centre College and Danville Community Members,

Welcome to the fourth annual Centre College RICE Symposium.

The symposium showcases students' academic work over the past year. This event represents a larger effort on campus and in the college's strategic plan to increase students' opportunities for engaged and experiential learning. We encourage students to be authors of knowledge, not just consumers of knowledge, and this event gives students the opportunity to share their knowledge with a larger scholarly community. In addition, the opportunity to present one's work in a conference-like setting as an undergraduate provides important preparation for graduate school, professional programs (e.g., law, medicine), and career development.

This year, 149 presentations from across the academic disciplines are celebrated on campus. The diversity of the presentations adds to our understanding of the world around us.

We invite symposium attendees to come and go from the Oral Presentations, Poster Presentations, Musical and Dramatic Performances, Art Exhibit, and John C. Young Presentations. When attending any of these sessions, we ask that you not leave or enter the room during a speaker's talk out of courtesy to the speaker. Thank you for your consideration. Enjoy the symposium!

Sincerely,

Melissa Burns-Cusato
2011 RICE Committee Co-Chair

John Perry
2011 RICE Committee Co-Chair

TABLE OF CONTENTS

2	Symposium Planning Committee
3	Schedule at a Glance
4	Oral Presentations, Part 1 of 2
7	Oral Presentations, Part 2 of 2
10	Musical and Dramatic Performances
11	Poster Presentations
13	Art Show Exhibit
14	John C. Young Presentations
15	Abstracts for Oral Presentations
32	Abstracts for Musical and Dramatic Performances
33	Abstracts for Poster Presentations
40	Abstracts for John C. Young Presentations
42	Name Index

2010 RICE SYMPOSIUM PLANNING COMMITTEE

Melissa Burns-Cusato
Committee Co-Chair
Assistant Professor of Behavioral Neuroscience

John Perry
Committee Co-Chair
Assistant Professor of Economics

Stephanie Fabritius
Vice President for Academic Affairs
Dean of the College
Professor of Biology

With Special Assistance from

Jami Powell
Interim Director of the CTL &
Coordinator of Academic Technologies and Media Resources

Candace Wentz
CTL Coordinator of Instructional Technology

Patrick Lowe
CTL Event Coordinator and Technician

Lisa Curlis
CTL Office Manager

Shayne Jarman
Crouse Academic Secretary

SCHEDULE AT A GLANCE

THURSDAY, APRIL 14, 2011

2:00-3:30pm

- Oral Presentations, Part 1 of 2, Young Hall
 - Light hors d'oeuvres and beverages will be served

3:45-5:15pm

- Oral Presentations, Part 2 of 2, Young Hall
 - Light hors d'oeuvres and beverages will be served

5:30-6:30pm

- Musical and Dramatic Performances, Grant Hall
- Poster Presentations, Norton Center for the Arts (Lobby)
 - Heavy hors d'oeuvres and beverages will be served

FRIDAY, APRIL 15, 2011

4:00-5:00pm

- Art Show, Jones Visual Arts Center (Aegon Gallery)
 - Hors d'oeuvres and beverages will be served

Saturday, APRIL 16, 2011

10:00am-2:30pm

- John C. Young Scholar Presentations, Campus Center (Ewen Meeting Room)
 - Heavy hors d'oeuvres and beverages will be served

ORAL PRESENTATIONS, PART 1 of 2

Thursday, April 14, 2011

2:00-3:30pm

Young Hall

Please note that each presenter will have 12 minutes to present plus 3 minutes for questions and answers. There will be a 5 minute break between each oral presentation to allow audience members to come and go to other oral presentation sessions. Out of courtesy to the presenters, please do not enter a session after the speaker's start time has commenced. Thank you for your understanding.

SESSION I, YOUNG 101

Moderator and Timekeeper: Benjamin Knoll

- 2:00pm 1. A Study of Ideological Constraint: Centre College Students vs. the General Public, *Paige Burton, Allen Schagene, Shea Agnew, Grant Leonardi, Juliya Grigoryan, and Jeffrey Buckhout*
- 2:20pm 2. Project 2020, *Randy Boll*
- 2:40pm 3. The Information Age: An Opportunity for Anarchism, *Jenn Joines*
- 3:00pm 4. Female Warriors: A tradition of female self-sacrifice in Vietnam, *Natalie Pope*

SESSION II, YOUNG 102

Moderator and Timekeeper: Stephanie Dew

- 2:00pm 5. Calcium-induced Conformational Change and Antimicrobial Properties of Calprotectin, *Laura Hench*
- 2:20pm 6. Neuropharmacology of Hallucinogens, *Brian Hodge*
- 2:40pm 7. Poverty and Food: Food Resources in the Danville Community, *Heather Walls*
- 3:00pm 8. Optimizing MurA Purification, *Ben Boone*.

SESSION III, YOUNG 110

Moderator and Timekeeper: Daniel Kirchner

- 2:00pm 9. Illegal and Pious Service to the God: Socrates as Hero in Plato's "Apology", *Kevin Sar*
- 2:20pm 10. A Methodological Problem Between the Concepts of 'God' and 'Goodness', *Lauren Mashburn*
- 2:40pm 11. The Extension Account: Concerning the Moral Standing of Groups, *Dustin Bishop*
- 3:00pm 12. Ecocentric Holism: Moving Beyond Anthropocentrism in Modern Conservation Initiatives, *Kyla Schneiders*

SESSION IV, YOUNG 111

Moderator and Timekeeper: Ken Keffer

- 2:00pm 13. French-American Relations and the Role of Societal Perceptions, *Abby Woehrlé*
- 2:20pm 14. Courtly Love in France of the Middle Ages, *Tess Simon*
- 2:40pm 15. The Theatre of the Absurd, *Kasey Jackson*
- 3:00pm 16. Les Misérables by Victor Hugo: How Victor Hugo portrays the changing nature of society through one scene, *Jenna Hoglen*

SESSION V, YOUNG 112**Moderator and Timekeeper: Dan Manheim**

- 2:00pm 17. The Birth of Catalan Modernism: An Examination of Casas, Rusiñol, and Picasso, *Cortney Miller*
- 2:20pm 18. Painting with Words: The Colors of Emily Dickinson, *Erin Baumgartner*
- 2:40pm 19. Those Dying Then: Emily Dickinson and the Processing of the American Civil War, *Marc Bentley*
- 3:00pm 20. "Mountains as Madonnas": The Creation of Empowered Feminine Space in Emily Dickinson's Nature Poems, *Chelsea Apple*

SESSION VI, YOUNG 138**Moderator and Timekeeper: David Anderson**

- 2:00pm 21. Legal Aid Society Internship, *Dallas Selvy*
- 2:20pm 22. An Examination of Variables that Influence Warmblood Sporthorse Stud Fees, *Jennifer Czubak*
- 2:40pm 23. An Analysis of Factors Effecting Presidential Election Outcomes on a County by County Basis: A 2008 Cross Sectional Survey, *Pearce Nesbitt*
- 3:00pm 24. The Economics of Crime in Metropolitan Areas, *Jeremy Gesser*

SESSION VII, YOUNG 139**Moderator and Timekeeper: Brian Storz**

- 2:00pm 25. Nueronal Plasticity Propagation via Drug Addiction, *Jacob Edwards*
- 2:20pm 26. A Focal Examination of Infant Social Interactions, *Emily Gregory, Alisen Huff, and Summers Lee*
- 2:40pm 27. An Avian Model of Fertility Enhancement Using Sexual Conditioning, *Ryan Will and Alisen Huff*
- 3:00pm 28. The Effects of Troop Size and Age on Frequency and Duration of Play in Vervet Monkeys, *Jordan Davis, Leah Oberst, and Hannah Greer*

SESSION VIII, YOUNG 201**Moderator and Timekeeper: Jeff Fieberg**

- 2:00pm 29. Photon Controlled Nanoswitches, *Ben Slone and Willie Polio*
- 2:20pm 30. Nanoscale Biosensing, *Hillary Botts*
- 2:40pm 31. Ancient Amulets: Unraveling History with Chemistry, *Lora Gralheer*
- 3:00pm 32. GC/MS Trace Analysis of Pharmaceutical and Personal Care Products in Surface Waters, *Ben Hume*

SESSION IX, YOUNG 244**Moderator and Timekeeper: Ed Montgomery**

- 2:00pm 33. The Psychology Behind French Art, *Jordan Davis*
- 2:20pm 34. World Camp in Malawi: Effects of culture on a population's health, *Catherine Mannon*
- 2:40pm 35. Incentives and Smoking: What causes people to quit?, *Carl Evans*
- 3:00pm 36. Improving Healthcare in Liberia, *Brittany Corrigan*

SESSION X, YOUNG 246

Moderator and Timekeeper: Larry Bitensky

2:00pm 37. Arabic Transplant Words in Modern French and Spanish, *Ashley Mayho*

2:20pm 38. Manifestations of Religion in *Les Misérables*: the idolization of Cosette, *Laura Hansen*

2:40pm 39. Reality of the Nuclear Bombs, *Yuka Tamagawa*

3:00pm 40. The Music of "The Lorax Project", *Corwyn Wyatt*

ORAL PRESENTATIONS, PART 2 of 2

Thursday, April 14, 2011

3:45-5:15pm

Young Hall

Please note that each presenter will have 12 minutes to present with 3 minutes for questions and answers. There will be a 5 minute break between each oral presentation to allow audience members to come and go to other oral presentation sessions. Out of courtesy to the presenters, please do not enter a session after the speaker's start time has commenced. Thank you for your understanding.

SESSION XI, YOUNG 101

Moderator and Timekeeper: Dan Stroup

- 3:45pm 41. An Analysis of French and American Healthcare Systems--Why America will not move towards the French model that has been deemed the most effective healthcare system in the world, *Amy Dorsch*
- 4:05pm 42. The Effect of Partisan Polarization in Congress on the 2010 Health Care Reform, *Bethany Carson*
- 4:25pm 43. Ildebrando Pizzetti: Opera, Modernism, and Fascism, *Kristen Baumgartner*
- 4:45pm 44. The Bias Effect of Leadership Style on Presidential Decision-Making: George W. Bush and the Iraq War, *Paige Burton*

SESSION XII, YOUNG 102

Moderator and Timekeeper: Peggy Richey

- 3:45pm 45. Ocular Complications of Cryptococcal Meningitis in Patients with HIV, *Heather Walls and Joan Duggan, M.D. Infectious Disease, University of Toledo Health Sciences Campus, Research Advisor*
- 4:05pm 46. Comparative Healthcare Systems, *Jacob Edwards*
- 4:25pm 47. Yeast Propagation Growth Curve, *Emily Hogancamp*
- 4:45pm 48. Prolactin and Nest Attachment, *Annie Roessler*

SESSION XIII, YOUNG 110

Moderator and Timekeeper: David Hall

- 3:45pm 49. A Construction of a Marian Narrative in the Tradition of Kierkegaard, *Topher Smith*
- 4:05pm 50. Homosexuality in the Bible, *Sara Mishu*
- 4:25pm 51. Khirbet Qana: A Case Study of Religious Identities and Interactions during the Byzantine Era of Pilgrimage to the Holy Land, *Katherine Dyche*
- 4:45pm 52. Persecution of Buddhism in Meiji Japan, *Jim Ransdell*

SESSION XIV, YOUNG 111

Moderator and Timekeeper: Patrice Mothion

- 3:45pm 53. The Unexpected Connections Between Chéri and The Graduate, *Alex Skees*
- 4:05pm 54. Seduction and Warfare: Conflict in a post-revolutionary France, *Megan Miller*
- 4:25pm 55. Josephine de Beauharnais, and her influence on Napoleon, *Rachel Blank*
- 4:45pm 56. The Vichy Paradox: "Liberté, Égalité, Fraternité" to "Travail, Famille, Patrie.", *John Blair*

SESSION XV, YOUNG 112

Moderator and Timekeeper: Phyllis Passariello

- 3:45pm 57. A Systematic Analysis of Animal Rights and Speciesism with relation to Animal Rites and Silence of the Lambs, *Kara Beer and Brian Anderson*
- 4:05pm 58. "The Horror, the horror: music videos, pop culture and meaning.", *J.T. Leak, III*
- 4:25pm 59. The Prospects for Project-Based Learning (PBL) as a Sustainable Model for Teaching, *Kiara Roberts*
- 4:45pm 60. Castellers and Catalunya, *Regina Basconi*

SESSION XVI, YOUNG 138

Moderator and Timekeeper: Marie Petkus

- 3:45pm 61. Internship at China Galaxy Securities Co., *Yue Wu*
- 4:05pm 62. The Effects of Workplace Smoking Bans on Smoking Prevalence: A State Level Analysis, *Chelsea Stanley*
- 4:25pm 63. Vehicular Fatalities and America's Youth: Does Driver Licensing Methodology Make a Difference?, *Chris Morris*
- 4:45pm 64. Mega-events, Symbolic Politics, and Developing Countries: The Changing Nature of Power in the International Arena, *Ashton Hupman*

SESSION XVII, YOUNG 139

Moderator and Timekeeper: Brian Cusato

- 3:45pm 65. Snake Alarm Responses in Barbadian Vervet Monkeys, *Ryan Will, Sam Morgan, and Katie Penn*
- 4:05pm 66. Maternal Influences on Parent-Offspring Kin Recognition in Japanese Quail (*Coturnix japonica*), *Emily Gregory and Kendra Montejos*
- 4:25pm 67. The Effects of Biofeedback on Performance of a Visual Attention Task, *William George, Lindsey Clark, Myaa Lightfoot, and Matt Williams*

SESSION XVIII, YOUNG 201

Moderator and Timekeeper: Jennifer Muzyka

- 3:45pm 68. Scoring with NOE Restraints Improves Protein Structure Results, *Louesa Akin, Jens Meiler and Brian Weiner of Vanderbilt University*
- 4:05pm 69. Virtual Screening of MurA: Elucidation of Potential Inhibitors, *Zachary Sweeney*
- 4:25pm 70. Metabolomic Screening, *Brian Hodge*
- 4:45pm 71. Study of the Yeast Cadmium Factor 1, Ycf1p, and the Protein Interactor, Eug1p, *Brian Hodge*

SESSION XIX, YOUNG 244

Moderator and Timekeeper: John Wilson

- 3:45pm 72. Using topology to protect a forest?, *Evan Shirley and Ibrahim Jadoon*
- 4:05pm 73. Cracking the K13 Elliptic Curve Code, *Ryan Curry*
- 4:25pm 74. Creating a Personal, College Endeavor, *Brantley Gunn*
- 4:45pm 75. Praying in the Garden: Reimagining Kentucky Culture Through A Trial of its Place-Based Literature, *Caroline Stephens*

SESSION XX, YOUNG 246

Moderator and Timekeeper: Jason Neiser

3:45pm 76. Physically-Derived Cellular Automaton Models of Snow Crystal Growth, *Everett Boyer*

4:05pm 77. Metal Grating-Waveguide Resonators and Phase-shifted Structures, *Jerry Yang*

4:25pm 78. Development of Numerical Representation in Children, *Jennifer Bohnert*

4:45pm 79. Voir Dire, Change of Venue, and "Legal Desirability": Hidden Jury Bias in High PTP Cases, *James Melloan and Andrew Augustus*

MUSICAL AND DRAMATIC PERFORMANCES

Thursday, April 14, 2011

5:30-6:30pm

Grant Hall

(Audrey R. Gillespie Recital Hall and Black Box Theatre)

Audrey R. Gillespie Recital Hall

Moderator and Timekeeper: Nathan Link

5:30pm 80. Centre College Early Music Ensemble, *Daniel Walton, Corwyn Wyatt, Jason Greene, Jimmy Kalb, and Scott Albertine*

5:50pm 81. Live Gospel Recording, *Curtis Donald, Jr.*

6:10pm 82. A Sophomoric Composition for Classical Guitar, *Matthew Short*

6:30pm 83. Evoking It Through Accident, *Albert Hall*

Black Box Theatre

Moderator and Timekeeper: Matthew Hallock

6:15pm 84. The Art of Aerial Silks, *Kelley Bell, Becca Finney and Chelsea Apple*

POSTER PRESENTATIONS

Thursday, April 14, 2011

5:30-6:30pm

Norton Center for the Arts, Lobby

Heavy hors d'oeuvres and beverages will be served

85. Biochemical Characterization of MurA in Escherichia coli in the presence of inhibitor, *Kyle Forte and Katie Lentz*
86. Genetic Disparity Between Populations of Caribbean Gnathiids, *Sarah Wilson, Jill Krier and Whitney Sears*
87. Redefining Leadership: What it Means to be a Servant Leader, *Travis Adams, Meghan Hawthorne, Julie Springate and Jordan Shewmaker*
88. Dramaturgy for Tom Stoppard's Arcadia, *Whitney Brown*
89. Factors that Affect Visitors to Cleaning Stations in San Salvador, Bahamas, *Sarah Wilson, Sarah Humphries, Christina Vincent and Jacquie Kalugyer*
90. Strategies for Teaching Primary Math, *Mary Kathryn Dilisio*
91. Determinants of Average Attendance for Major League Baseball Teams, *Kyle Binder*
92. The Influencing Factors on Heart Disease Mortality Rates, *Katie Herren*
93. Multi Species Snapper Schooling, *Taylor Childress, Nicole Webb, Meredith Mayfield and Elizabeth Fenwick*
94. Using Metacognition Strategies to Master Mathematical Concepts, *Mary Diemer*
95. Determining the Salary of Major League Baseball Hitters, *Jordan Ellis*
96. Conical Nanopores as Light-controlled Switch, *Willie Polio and Ben Slone*
97. The Role of the Membrane-bound Protein Transporter, Ycf1p in *C. glabrata* Viability, *Stephen Howell*
98. Refinement of MurA Structure, *Emily Hogancamp*
99. A comparison of mutability across entity and relational nouns, *Sarah Cao*
100. Thermally Induced Spadefoot Plasticity, *Cailynn West*
101. My Project to Increase Automaticity in Math for Second Grade Students, *Sarah Ronald*
102. Ephraim McDowell Health Community Service, *Trinity Hochstetler*
103. An Investigation of Bulgarian Solitaire, *Kelley Lynch*
104. Food Knowledge and Preferences, *Madri Faul*
105. Effects of Spelling Progress Charts on the Spelling Accuracy/Improvement of First Grade Students, *Lydia McCollum*
106. Math Intervention: Closing the Gap, *Jenny Young*
107. Restoring a Kentucky Prairie: GIS Analysis of Native and Invasive Non-Native Plant Species, *Pavan Podapati*
108. Unmixing Population Genetics Data, *Jasmin Kaeser*
109. The Effects of Alcohol on the Stress Responses of Japanese Quail is Dose Dependent, *Rachel McClain*

110. Invasion patterns and ecosystem impacts of *Rhamnus davurica* (Dahurian buckthorn), *Daniel Walton*
111. Extracellular DNA vs. extracellular DNase, *Brian Lim*
112. The effect of pineal melatonin on locomotion and vocalization in the male zebra finch, *Taeniopygia guttata.*, *Jennifer O'Brien*
113. Evaluation of Polyester 'Nanosponges' for Therapy with Emphasis on Tumor Cell and Vascular Targeting, *Aaron Edwards*
114. Simplified IV Insulin Infusion Protocol for Glycemic Control in Critical Care, *David Carlson, Rodney Thompson, Pharm.D., Ph.D.; J. Timothy Sowell, Pharm.D.; Michael G. Carlson, M.D., Departments of Medicine and Pharmacy, Centennial Medical Center, Nashville, TN, USA*

ART EXHIBIT

FRIDAY, APRIL 15, 2011

4:00-5:00pm

Jones Visual Arts Centre, Aegon Gallery

Hors d'oeuvres and beverages will be served

- 115. *J.B. Boone*
- 116. *Carolyn Morris*
- 117. *Angela Herde*
- 118. *Lillian Semedo*
- 119. *Elizabeth Thompson*
- 120. *Marla Sweitzer*
- 121. *Amber Martin*
- 122. *Jennifer Griffith*
- 123. *Kelley Bell*
- 124. *Ty Wilkinson*
- 125. *Ya Ya Zhou*
- 126. *Shuang Liu*
- 127. *Laura Clay*
- 128. *Carolyn Morris*
- 129. *Bekah Rehkamp*
- 130. *Carol Denney*
- 131. *Cooper McGuire*
- 132. *Houston Taylor*
- 133. *Mary Trollinger*
- 134. *Kasey Jackson*
- 135. *Jacqueline Winter*
- 136. *David Wunningham*
- 137. *Lauren Everett*
- 138. *Robert Baxter*
- 139. *Zara Horton-Thomas*
- 140. *Erin Sliney*
- 141. *Jessica Maddox*
- 142. *Erin Baumgartner*

NOTE: This is a listing of the artists showing in the Art Exhibit. For information on specific works included in the exhibit, please visit the Aegon Gallery.

JOHN C. YOUNG PRESENTATIONS

SATURDAY, APRIL 16, 2011

10:00 a.m. – 2:00 p.m.

Campus Center, Ewen Meeting Room

Heavy hors d'oeuvres and beverages will be served

143. 10:00am Impact Assessment in Microfinance, *Morgan Lynn*
144. 10:30am Parent-Offspring Kin Recognition in Japanese Quail: The Role of Parental Care, *Emily Gregory*
145. 11:00am Microvessel regulation by tyrosine hydroxylase-immunoreactive interneurons in the developing rat and the adult human cerebral cortex, *Ben Cocanougher*
146. 11:30am From Page to Stage: Adapting Chuck Palahniuk's *Haunted*, *Sam Yates*
147. 1:00pm The "Petticoat Brigade" versus the "Iron-Jawed Angels": Using the Twentieth-Century American Woman Suffrage Campaign as a Model for American Socio-Political Movements, *Maria Kennedy*
148. 1:30pm Perhaps in Lesbos': Lesbian Identity and Novelistic Production in Inter-War France and England, *Elisabeth Randall*
149. 2:00pm Livin' the Dream: Nashville Songwriter Culture in Film, *Rachel Skaggs*

ABSTRACTS: ORAL PRESENTATIONS

1. A Study of Ideological Constraint: Centre College Students vs. the General Public, *Paige Burton, Allen Schagene, Shea Agnew, Grant Leonard, Juliya Grigoryan, and Jeffrey Buckhout, Government*
Mentor: Benjamin Knoll, Government

Citizen ability to identify political parties and candidates ideologically is shaped by the level of constraint each citizen has. Education is one way to increase ideological constraint among individuals. Building upon Converse's study of constraint, we hypothesize that Centre students will have more constraint than the general public. Furthermore, we estimated that constraint should increase as the education increases. To measure this we asked Centre students their political ideology and then applied this to questions that measured their policy preferences. If the students' answers to one question helped predict their answers to the other questions, this would indicate a higher level of constraint. The findings indicate that Centre students have a higher amount of constraint than the general public. The results show that constraint does not increase with an increase in education, which means there are other factors that may affect constraint such as generational effects, and emotional cycles.

2. Project 2020, *Randy Boll, Government*
Mentor: Christopher Paskewich, Government

In the ensuing years of the information age, collaborative building will be an indispensable asset to any organization. The form of collaborative nature that I have pursued is a "web-experience constellation" known as Project2020. The goal of this constellation of related websites is creating a place where young people can embrace the seamless and barrierless world of the information age. Project2020 is composed of 3 main websites: Jackthatwebsite, Projectmmxx, and Wikibook. The goal is achieving a network where people in India are able to converse and coalesce with people in Ohio, without "friending." The goal of Project2020 is achieving a free flow of ideas and dissemination of information. Therefore, Project2020's tagline is "Log On, Be Heard." I have intensely studied relevant literature on the information age and seek to apply that knowledge in the form of a website project. My research contribution is to show the theory/application of the information age.

3. The Information Age: An Opportunity for Anarchism, *Jenn Joines, Government*
Mentor: Christopher Paskewich, Government

What threat does the information age present to the current political climate? Despite its relative infancy, the information age has come to be seen as an antagonist to governments. It triggered many problems that tear at the foundation of centuries of political development. Its technology has caused a decentralization of the nation-state and has challenged sovereignty. The nation-state has attempted to harness the power of technology, resulting in even more conflict. I will argue there is an alternative to the nation-state by using texts by Alvin Toffler, Nick Dyer-Witford, Manuel Castells, Richard Clark and Daniel Cohen. I will argue that the information

4. Female Warriors: A tradition of female self-sacrifice in Vietnam, *Natalie Pope, History*
Mentor: Clarence Wyatt, History

Stemming from a rich oral tradition of mythical women warriors, Vietnamese women embody a self-sacrificial identity. It is this mentality of self-sacrifice that has enabled fundamentally opposing cultural elements of woman-warrior myths and Confucian female submission to coexist simultaneously in Vietnam. Whether life or freedom, the nature of female self-sacrifice is determined by the current needs of society. However, viewing the role of Vietnamese women through this context explains both the emergence of a strong female presence in the anti-colonial wars of the twentieth century and the subsequent diminishing of wartime liberation with the advent of peace. Vietnamese women's social liberation is not a function of forward momentum like that of the West's feminist's movements. The changing roles of women in Vietnam are rather part of a larger, cyclical tradition; the continuous oscillation between docile wife and Amazonian warrior represents the myriad manifestations of the ever-present feminine self-sacrifice.

5. Calcium-induced Conformational Change and Antimicrobial Properties of Calprotectin, *Laura Hench, Biochemistry and Molecular Biology/Biology*
Mentor: Stephen Asmus, Biochemistry and Molecular Biology/Biology

Recent work demonstrating that the vertebrate host sequesters zinc and manganese has reinforced the importance of metal sequestration as a defense against bacterial infection. Previously we determined that

human calprotectin plays a critical role in defense against *Staphylococcus aureus* infections by chelating the essential nutrients zinc and manganese. Calprotectin is a heterodimer of EF-hand proteins S100A8 and S100A9. Given the calcium-induced conformational changes in S100 proteins, we hypothesized that calcium may influence the antimicrobial activity of calprotectin. To investigate this hypothesis we examined the effect of calcium availability on the ability of calprotectin to inhibit *S. aureus* and *Acinetobacter baumannii* growth (both species are of medical concern due to their increasing antibiotic resistance). Utilizing site-directed mutagenesis to disrupt the ability to bind calcium, our results indicate that the calcium-induced conformational change in calprotectin increases antimicrobial activity. Further investigations of the zinc/manganese binding properties of these calcium binding mutants will elucidate the modulatory effect of calcium on the antimicrobial activity of calprotectin.

6. Neuropharmacology of Hallucinogens, *Brian Hodge, Biochemistry and Molecular Biology/Biology*
Mentor: Stephanie Dew, Biochemistry and Molecular Biology/Biology

Last fall Dr. Dew and I took part in a semester long independent study with the intent of understanding the biochemistry and neurological interactions of commonly used recreational drugs. Our research was done entirely through the use of published scientific literature (we did not attempt any actual experimentation), allowing us to analyze the historical context, mechanism of drug uptake, and the neuropharmacology of commonly abused drugs. We studied a broad range of drugs including: opiates, amphetamines, alcohol/depressants, cannabinoids, hallucinogens, and steroids. I will be presenting on what I found to be the most interesting and unique class of drugs: hallucinogens. Hallucinogens, commonly known as psychedelics, are psychoactive substances that extremely alter states of consciousness. I plan to explain how these drugs (LSD, DMT, Mescaline, Psilocybin.. etc) interact as agonist to a common 5HT_{2A} (Serotonin) receptor, their history, social impacts (and stigmas), their postulated mechanism of action, and their therapeutic potentials.

7. Poverty and Food: Food Resources in the Danville Community, *Heather Walls, Biochemistry and Molecular Biology/Biology*
Mentor: Stephanie Dew, Biochemistry and Molecular Biology/Biology

This presentation details the procedure and results of an independent study completed in the Fall of 2010. The focus of this project was the availability of food and nutritional resources in the Danville community. After difficulties encountered during the initial research phase, it was determined that a more comprehensive list of resources needed to be made available to the general population in order to improve both awareness and availability. Food Resource Guides were created for both Low-Income Households and Seniors in the area; included in these guides were food pantries, government agencies, discount food programs, and information about both transportation and required paperwork. Information was also provided about the basic nutritional needs met by these different programs. As a result of this project both electronic and paper copies were distributed to the various programs in Danville and can continue to be updated as more resources become available.

8. Optimizing MurA Purification, *Ben Boone, Biochemistry and Molecular Biology/Chemistry*
Mentor: January Haile, Biochemistry and Molecular Biology/Chemistry

The widespread use of antibiotics to treat bacterial infection has selected for antibiotic resistant strains of bacteria. Fosfomycin is an example of a broad spectrum antibiotic that has become less effective because of increased bacterial resistance. Fosfomycin inhibits synthesis of peptidoglycan, a structural component of the bacterial cell wall, by covalently binding to the phosphoenolpyruvate binding site of the enzyme MurA, an essential enzyme in the peptidoglycan synthesis pathway. The MurA gene has been cloned and transformed into *E. coli* for overexpression and purification. MurA enzymatic activity with the appropriate substrates is detected by monitoring the release of inorganic phosphate with malachite green as an indicator. Recently, levels of MurA produced in our research have been significantly low, so current research is being conducted to discern specific causes. This includes the use of different host cells that will potentially improve MurA yield.

9. Illegal and Pious Service to the God: Socrates as Hero in Plato's "Apology", *Kevin Sar, Philosophy*
Mentor: Eva Cadavid, Philosophy

This paper examines Plato's intent in writing the Apology insofar as it relates to his rhetorical treatment of two of the most central and intertwined questions which arise within it: that of Socrates' legal guilt and that of his moral culpability, i.e. whether he acts impiously. In other words, for whom does Plato write the Apology,

and what does he wish to convince them concerning Socrates' legal and moral status? Plato, I argue, crafts the Apology as a layered text for two distinct audiences—his close associates and the rest of the Athenian citizenry—such that each is likely to reach a significantly different conclusion about Socrates. I suggest that while Plato aims to present Socrates to the Athenian citizenry as a heroically pious and law-abiding citizen, to his close associates he is willing to make a startlingly subversive claim: Socrates is guilty as charged, but remains heroically pious nonetheless.

10. A Methodological Problem Between the Concepts of 'God' and 'Goodness', *Lauren Mashburn, Philosophy*
Mentor: Daniel Kirchner, Philosophy

There is a complex relationship between the concepts of 'god' and 'goodness' in the philosophy of religion. As one establishes a concept of God (or 'goodness'), there are inherent limitations on how one can define 'goodness'(or God) according to the definitional qualities that are compatible with each other. This is problematic because 'God' and 'goodness' should be defined independently of each other. In presenting this dilemma, I first discuss different definitions of goodness and identify the implications they have on "God-ness". Then I address the reverse relation: the implications definitions of "God-ness" have on goodness. Finally, I demonstrate the implications this quandary has for the philosophy of religion by analyzing specific lines of text that allegedly have one meaning, but in analysis are shown to have an array of interpretations. Consequently, I show that philosophical terminology should be chosen with care and precisely defined when discussing God or goodness.

11. The Extension Account: Concerning the Moral Standing of Groups, *Dustin Bishop, Philosophy*
Mentor: Daniel Kirchner, Philosophy

The first part of this paper discusses the two primary theories that have attempted to provide groups with moral status. By examining their respective methods for assigning moral rights to a group, I elucidate problems in both accounts, showing them insufficient in their attempt to defend group ethics. The corporate account establishes a group identity entirely separable from the identities of its individuals. However, this allows the rights of the individuals to clash with those of the group. The collective account asserts that the group identity, and the only source of a group's moral status, lies in the sum of the rights of its members, creating a group-as-a-whole. This, however, poses the practical problem of changing numbers within a group, and shifts in membership. I introduce my own group identity theory, the extension account, which provides the possibility of a group that can hold rights by virtue of its being made of autonomous individuals who all bear moral standing and are subject to the moral responsibilities relevant to their membership within the group. The extension account establishes an identity of the group-itself, separate from its members, but the origin of its moral status is extended directly from the individuals who comprise it.

12. Ecocentric Holism: Moving Beyond Anthropocentrism in Modern Conservation Initiatives, *Kyla Schneiders, Philosophy and Biology*
Mentors: Daniel Kirchner, Philosophy and Matthew Klooster, Biology

In this paper the value systems of shallow ecology, deep ecology, deep green theory, and ecocentric holism are evaluated with the aim of examining which provides the foundations necessary for eliminating egotism from modern conservation initiatives. The environmental ethic, ecocentric holism, captures this account of value and with the addition of one important distinction can fully explain the role of humans in relation to their environment. I argue that it is necessary for inherent natural value and holism to be incorporated into an environmental ethic in order to gain a full understanding of the way that humans should act with regard to the biosphere. Value originates from the environment, but the ability to recognize and categorize this value lies in living organisms. With a holistic worldview and concern for the interconnectedness of ecosystems, humans can evaluate the environment in the way most effective for the continued progress of modern conservation.

13. French-American Relations and the Role of Societal Perceptions, *Abby Woehrle, French*
Mentor: Ken Keffer, French

As an expansion of an independent study conducted in Strasbourg and Paris, France, this presentation examines my previous research about French perceptions of Americans and broadens these conclusions to explore the impact of societal perception in French-American relations. Through the analysis of polling and public opinion data, this study presents the public attitudes of the United States and France towards certain issues, and explores the implications of these opinions in regards to policy, society, and cultural identity. In conclusion, this study seeks to answer the following questions: To what extent does public opinion affect the decisions of top policy-makers? How have societal perceptions played a role in French-American relations?

To what extent did French public opinion play a role in the French government's criticism of the 'War on Terror'?

14. Courtly Love in France of the Middle Ages, *Tess Simon, French*
Mentor: Ken Keffer, French

The courtly love tradition began in southern France with the songs of the troubadours, which centered on the ennobling quality of love, the elevation of the beloved lady, and the insatiability of love. As these songs began to be incorporated in European courts, rule books were written on courtly love which both catapulted the spread of the tradition and simultaneously transformed the ideas of the troubadours into a sterile and refined practice reserved for the bourgeois. Chretien de Troyes' *The Knight of the Cart*, written in 1177, embodies the characteristics of this courtly love tradition through Lancelot's love of Guinevere. From an examination of Lancelot's infatuation, the question arises as to whether courtly love might still exist in the modern world in a new and transformed form.

15. The Theatre of the Absurd, *Kasey Jackson, French*
Mentor: Ken Keffer, French

The Theatre of the Absurd highlights the emptiness of the human condition and the inaccessibility of a rational explanation of the universe. Samuel Beckett, a writer often associated with this movement, expresses his anxiety over an incomprehensible universe in *Endgame*. In this play, Beckett expresses the comical and sad pointlessness of human existence using language (both in meaning and form) and silence. The first line of the play sets the repetitive tone of the entire novel and reveals the cyclical nature of life in general. Because life merely consists of cycles, there is no ultimate product and thus, no other-worldly significance. Through an absurdist approach Beckett argues that existence is circular and forces us to examine our own existence.

16. Les Misérables by Victor Hugo: How Victor Hugo portrays the changing nature of society through one scene, *Jenna Hoglen, French*
Mentors: Ken Keffer and Patrice Mothion, French

In his classic novel *Les Misérables*, Victor Hugo reveals man's struggle to redeem himself for past mistakes while exposing the flaws in 19th-century French society. In one passage in the novel, reformed criminal Jean Valjean saves the life of Marius, his guardian's true love, in spite of his resentment of the man. Valjean overcomes his personal feelings and uses his physical strength to carry Marius through the sewers of Paris in order to save the man's life. Hugo uses this episode to show that no one has to follow the expectations and rules set by society. Instead everyone can think for himself. Hugo shows that there is a moral law superior to society's law. One person can make a difference and that difference can change the world for everyone.

17. The Birth of Catalan Modernism: An Examination of Casas, Rusiñol, and Picasso, *Cortney Miller, Art*
Mentor: Cristina Carbone, Art

The beginning of the twentieth century was a formative period for Barcelona in many ways. In the 1850s the destruction of the protective walls around the city led to great expansion and the development of the Eixample, providing architects with a blank canvas. The influence of Art Nouveau led to the birth of Catalan modernisme, an artistic movement that included literature, architecture, and fine arts. Two artists in particular, Ramon Casas and Santiago Rusiñol, were pioneers of modernisme, establishing the unique characteristics of painting and poster design. Both spent time studying and working in Paris, and were influenced by French impressionism and naturalism. The two worked closely together, producing images that were at times considered racy for their subjects. Their most significant legacy can be found in the work of Pablo Picasso, who was close personal friends with both Casas and Rusiñol and was greatly influenced by their work.

18. Painting with Words: The Colors of Emily Dickinson, *Erin Baumgartner, English*
Mentor: Daniel Manheim, English

George Frisbie Whicher once said that Dickinson's poetry, "...revels in gold, crimson, opal, ermine, purple and cochineal, but there is little substance within all this gorgeousness." (qtd. in Haenni 3) Such a statement could not be more wrong. Yet, for all of its importance in her poetry, research on Dickinson's use of color is surprisingly difficult to come by. The purpose of this paper is to explore the colors of Dickinson's poetry, not

as symbolic tools, but as a significant influence on how the reader visualizes the poem. The colors form the essential bare bones of the poem, constructing a backdrop against which Dickinson offsets the rest of her poetical imagery and form. Ultimately, Dickinson's unique use of color is an aspect of her writing that allows her to create and exploit its endless possibilities far more faithfully and with more power than any painter could ever hope to.

19. Those Dying Then: Emily Dickinson and the Processing of the American Civil War, *Marc Bentley, English*
Mentor: Daniel Manheim, English

Emily Dickinson composed the majority of her poems during the Civil War, yet for years, scholars were at best reticent and at worst fully in denial about the impact such a violent, nation-encompassing event such as the war had on her poetry. After all, they argued, Dickinson had no close relatives fighting in the war, no major skirmishes of any kind were fought anywhere near her hometown of Amherst, Massachusetts, and there are no explicit references to battles in her works. Recent scholars have begun to explore how the poet explored her reactions to the war in her subtle and subversive manner, but none have yet connected her war experiences to her post-war poetry. This presentation will look at how wartime trauma deeply affected the poet, illustrating the deep psychological impact this event had on her, and discuss her meditations on how war affects homes, families, soldiers, and the nation-at-large.

20. "Mountains as Madonnas": The Creation of Empowered Feminine Space in Emily Dickinson's Nature Poems, *Chelsea Apple, English*
Mentor: Daniel Manheim, English

Emily Dickinson was acutely attuned to the natural world: the language of femininity in her nature poems celebrated the beauty without, and – perhaps more importantly – helped her to construct a spiritually significant space within. Feminized nature was her personal sanctuary, where she could commune freely with the divine. From this space, Dickinson was able to draw the sense of self-identity and creative authority that enabled her to subvert masculine orthodox religion and create a religion of personal, feminine empowerment. I will first examine how Dickinson's sensory experience of Nature facilitated her awareness of the divine; next, I will explore how Dickinson utilized the language of femininity in her nature poems to create a spiritually-significant space, allowing her direct access to the divine; finally, I will examine how this space infused Dickinson's poetic voice with the authority she needed to override patriarchal orthodoxy and recreate divinity in her own, feminine image.

21. Legal Aid Society Internship, *Dallas Selvy, Economics*
Mentor: David Anderson, Economics

For Centre Tem 2011 I completed an Internship at the Legal Aid Society in Louisville, Kentucky. My experience included work in the Marketing and Development office, as well as attending Family and Eviction Court with the Attorneys. I credit my experience at Legal Aid with shaping my goals for graduate studies and future career choices.

22. An Examination of Variables that Influence Warmblood Sporthorse Stud Fees, *Jennifer Czubak, Economics*
Mentor: Bruce Johnson, Economics

A double-log model was used to analyze the prices of American and European Warmblood stallion stud fees. The final specification of the model identifies several characteristics of stallions that have an effect on warmblood sporthorse stud fees. The model shows that certain physical characteristics of stallions, particularly age and height, increase a stallion's stud fee. Other physical characteristics, such as a specific coloring or a specific breed of warmblood, were slightly significant for certain variables. Furthermore, the model also supported the hypothesis that European warmblood stud fees are greater than American warmblood stud fees.

23. An Analysis of Factors Effecting Presidential Election Outcomes on a County by County Basis: A 2008 Cross Sectional Survey, *Pearce Nesbitt, Economics*
Mentor: Bruce Johnson, Economics

This paper seeks to determine to what degree socioeconomic factors determine the probability of a Republican presidential candidate's carrying a given county in the 2008 presidential election. Data was collected from state and federal statistical databases including but not limited to: the United States Statistical Abstract, Secretaries of State for various states and New York Times election results. These databases provided a sample of 1286 counties from 23 states and the District of Columbia. Binomial Probit and Logit

were used to estimate the models. Analysis of the preferred model showed that increased median income within a county raised the chances of that county being carried by the Republican candidate. Alternatively, increases in African-American/Hispanic populations and average educational attainment decreased the chances of a Republican victory.

24. The Economics of Crime in Metropolitan Areas, *Jeremy Gesser, Economics*
Mentor: Bruce Johnson, Economics

This paper analyzes the effects of sociological and economic variables on the supply and demand for crime in metropolitan statistical areas in the United States. For many years, crime was thought of as a psychological problem, but more recently, we have been able to analyze the determinants of crime using economics. To attain my results, I used multivariate regression analysis of U.S. Census Bureau and Bureau of Labor Statistics data. The results of the research varied due to issues within the statistical analysis, yet we see some empirical support for economic theory within the results. For example, the level of crime in a given metropolitan area has a positive effect on the demand for protection from crime, whereas the level of police spending in a given metropolitan area has a negative effect on the supply of crime.

25. Neuronal Plasticity Propagation via Drug Addiction, *Jacob Edwards, Behavioral Neuroscience/Biology*
Mentor: Brian Storz, Behavioral Neuroscience/Biology

Drug addiction is currently treated using behavioral modification methods, twelve-step programs for example, but recent studies have shown that long-term drug addiction can reprogram an addicts' genome, suggesting that behavioral modification methods may not be sufficient to treat drug addiction. My research surveys psychostimulants and psychodepressants and their mechanisms in creating context-specific addictions. General mechanisms involve modification of dopaminergic pathways in the mesolimbic-reward system of the brain. Cutting-edge research is in non-traditional treatments of addiction, one such venue is pharmacological treatments. Pharmacological therapies may have the ability to reverse genomic reprogramming. These treatments have the potential to eradicate addictive behavior, especially when paired with behavioral treatments, and thus, reducing dependence on addictive drugs. Additionally, a pharmacological treatment approach may be more effective than traditional behavioral methods because it has the potential to eliminate relapse in recovered addicts.

26. A Focal Examination of Infant Social Interactions, *Emily Gregory, Alisen Huff, and Summers Lee, Behavioral Neuroscience/Psychology*
Mentor: Melissa Burns-Cusato, Behavioral Neuroscience/Psychology

Social relationships are a crucial component of life for vervet monkeys (*Chlorocebus pygerythrus*). Vervets nurse to develop a secure attachment to their mother, groom to solidify social relationships, and play to develop fighting and social skills to aid them later in life. Infants were observed on the Barbados Wildlife Reserve in morning and evening observations in order to determine whether troop size affects infant social interactions. It was predicted that smaller, more vulnerable troops must devote more time to infant protection, whereas larger troops can devote more time to socializing. Focal infants were chosen and observers took a scan sample every minute, recording the number and gender of monkeys surrounding the infant. Infants in all troops spent significantly more time contacting adult females whereas larger troop infants spent significantly more time near other infants. Results supported the hypothesis that troop size affects the daily activities of infants.

27. An Avian Model of Fertility Enhancement Using Sexual Conditioning, *Ryan Will and Alisen Huff, Behavioral Neuroscience/Psychology*
Mentor: Brian Cusato, Behavioral Neuroscience/Psychology

In sexual conditioning experiments, a stimulus initially ineffective in eliciting a sexual response (a conditioned stimulus or CS) is paired with a member of the opposite sex (the unconditioned stimulus or US). After a number of pairings, the CS comes to elicit conditioned sexual behavior. The present experiment investigated whether sexual conditioning could enhance fertility in Japanese quail (*Coturnix japonica*) and whether this enhancement was affected by CS modality. Mature quail were conditioned using either a species-typical male call or an 800Hz arbitrary tone CS. The male and female quail that underwent conditioning developed significantly more conditioned responding and the females laid significantly more fertile eggs. But CS modality did not modulate these effects. These results indicate that arbitrary and species-typical auditory stimuli are equally effective in the sexual conditioning of Japanese quail, and sexual conditioning procedures may be used to improve reproductive success.

28. The Effects of Troop Size and Age on Frequency and Duration of Play in Vervet Monkeys, *Jordan Davis, Leah Oberst, and Hannah Greer, Behavioral Neuroscience/Psychology*
Mentor: Melissa Burns-Cusato, Behavioral Neuroscience/Psychology

Past research suggests play is used as practice for future adult activities, such as mating and fighting. This study examined the effects of troop size and age on both the frequency and duration of play in Vervet Monkeys inhabiting the Barbados Wildlife Reserve. It was hypothesized that the largest troop (troop 1) would exhibit the most play behavior. In terms of age, it was hypothesized that juveniles would play most with other juveniles, followed by juveniles with infants, and infants would play with other infants the least. Scan and focal sampling was used to gather data. There was a significant difference for frequency and duration of play between troops ($p < .05$), supporting our first hypothesis. Although there was also a significant difference concerning age and play behavior, it did not support our hypothesis. From this study, it can be concluded that troop size and age effect play behavior in Vervet Monkeys.

29. Photon Controlled Nanoswitches, *Ben Slone and Willie Polio, Chemistry*
Mentor: Jeff Fieberg, Chemistry

This project explores the possibility of fabricating photon controlled nano-switches. Azobenzene thiol molecules were synthesized and adsorbed onto a gold-plated, single conical pore (tip diameter ~ 1 nm) that had been chemically etched into an ion damage tracked polyethylene terephthalate (PET) membrane. The membrane was mounted in a conductivity cell between two 1 M KCl(aq) solutions. The ion current through the conical nanopore was measured over time at constant voltage. Trans-azobenzene isomerizes to cis-azobenzene in the presence of UV light, and this isomerization is reversible in the presence of visible light. The transition between the trans- and cis- isomer changes the resistivity of the membrane, causing an observable change in ion current. Results obtained show that reversible switches with this design are a viable approach to photon controlled nano-switches.

30. Nanoscale Biosensing, *Hillary Botts, Chemistry*
Mentor: Jeff Fieberg, Chemistry

The objective of this project was to fabricate a membrane with nanopores capable of sensing a bioterrorism agent in water. Polycarbonate plastic with both conical and cylindrical pores was used in order to create biosensors. The cylindrical pores were pre-made, but the conical pores were created through a process of isotropic and anisotropic etching. Both types of pores were gold-plated and functionalized with a molecular recognition agent (biotin) that was able to detect an analyte, streptavidin. The pores were placed in a conductivity cell with 1 M KCl on each side. Current-voltage measurements indicated the size of the pores and whether they were clogged due to the binding of analyte. After establishing a baseline, streptavidin was introduced to the KCl solution on the positively charged side of the conductivity cell. It was found that the conical pores were more effective in detecting the analyte, streptavidin.

31. Ancient Amulets: Unraveling History with Chemistry, *Lora Gralheer, Chemistry*
Mentor: Jeff Fieberg, Chemistry

When Dr. Beth Glazier-MacDonald of the Religion Program acquired corroded amulets from a private collector, a collaboration was necessary between science and religion in order to unroll the ancient amulets and decipher the messages hidden inside. By studying conservation practices that have been utilized on other ancient metals, a method was devised and implemented on these lead amulets. Thus, by combining art conservation methods and the chemistry of oxidation/reduction reactions, these amulets have been studied and are on the verge of being unrolled so that, in partnership with the Religion Program, the unknown meanings of the ancient artifacts may be revealed.

32. GC/MS Trace Analysis of Pharmaceutical and Personal Care Products in Surface Waters, *Ben Hume, Chemistry*
Mentor: Preston Miles, Chemistry

The purpose of this experiment was to test for pharmaceutical and personal care products (PPCP) target compounds in the surface waters surrounding Danville, KY. Gas Chromatography and Mass Spectrometry will be used to analyze trace concentrations of contaminants in the surface water in Danville. Pharmaceutical and personal care products enter the environment through many different avenues including excretion from the body and as run-off from agricultural sources into surface waters. The initial target compounds include Galoxilide, a fragrance, Atrazine, a pesticide, and Cotinine, a human metabolite. This analysis will give a basis for future research as well as possible explanations for biological anomalies in the

environment.

33. The Psychology Behind French Art, *Jordan Davis*
Mentor: Ken Keffer

This presentation explores the psychology behind two different genres of French art: literature and painting. In terms of literature, authors often times weave complex psychological ideas within the characters of their works. A prime example used will be that of "Swanns Way" by French author Marcel Proust. Proust presents an array of various characters that seem to psychologically suffer in abnormal manners. With painting, the psychological state of the artist is often impressed into their artwork. Picasso, who lived most of his life in France, represents this by creating artwork that falls into different "stages" depending on his current mentality at the time he created the piece. These are just two instances in which French art involves psychology in some manner and communicates this to the audience.

34. World Camp in Malawi: Effects of culture on a population's health, *Catherine Mannon, Chemistry*
Mentor: Ed Montgomery, Chemistry

During Centre Term of 2011 I acted as a volunteer intern with World Camp in Malawi. World Camp interns go into rural villages around the capital, Lilongwe, to educate youth about HIV/AIDS and deforestation. While there, I observed the impact that culture has on health in an impoverished nation. The major cultural issues that affect a person's health in Malawi are discrimination and social stigma, misconceptions and faulty medical sources, lack of resources (including licensed practitioners,) religious beliefs, poverty, social status, and the staple food system. By observing their society I was able to make connections about how our own culture affects our health.

35. Incentives and Smoking: What causes people to quit?, *Carl Evans*
Mentor: Marie Petkus

There is a general consensus about smoking cigarettes: it is hazardous to your health. To gain a better perspective on this agreement, this paper explores individuals behaviour with regards to smoking cigarettes, after finding out that they have a serious health condition. This study is the first of its kind to examine the decision to continue smoking after the diagnosis of the health condition has been made, rather than the risk of it potentially occurring. After running multiple models, our results suggest that a person, with knowledge that they have cancer or a lung condition, is significantly more likely to quit smoking. Likewise, we explore various demographic variables such as marital status, sex, age started smoking, length of years smoked and income which also contribute to a person quitting as well.

36. Improving Healthcare in Liberia, *Brittany Corrigan, Chemistry*
Mentor: Joe Workman, Chemistry

Over Centreterm 2011, I spent a month in the village of Camphor in Liberia (West Africa). In Camphor I worked to help develop a small clinic. I first began with education and vaccination campaigns, where I also took the opportunity to ask what the Liberian people wanted out of a clinic. I then visited various hospitals and other clinics around Camphor. I realized that surgery is not currently a realistic option for Camphor Clinic, but a functional maternity ward and blood transfusions are two goals within the clinic's reach. I, along with my advisor, also took measures to find the balance between affordable medicine for the Liberian people and a sustainable clinic that can run without financial support from donors from the West.

37. Arabic Transplant Words in Modern French and Spanish, *Ashley Mayho, French*
Mentor: Patrice Mothion, French

Due to powerful Arabic influence throughout the Iberian Peninsula, both the modern French and Spanish languages have developed many common words of Arabic origin. Examples of these commonalities include words used to describe household items, foods, scientific principles, mathematical topics, and others. To determine the extent of the influence of the Arabic conquest on the development of the French and Spanish languages, the etymologies of a broad sampling of common words will be studied. The word origins will be examined and compared in order to determine the extent of Arabic vocabulary in the traditional Romantic languages.

38. Manifestations of Religion in Les Misérables: the idolization of Cosette, *Laura Hansen, French*
Mentor: Patrice Mothion, French

Victor Hugo's 19th century epic novel *Les Misérables* provides insight into the prevailing religious beliefs of the time. In particular, Jean Valjean's ideas about God and the church are manifest in the pervading theme of religion throughout the work. Cosette embodies all of the love Valjean feels; she is his mother, his wife, his daughter, and his God.

This paper explores Valjean's multi-dimensional, peculiar relationship with Cosette and the evolution of this connection. *Les Misérables* begs the questions, Why did Hugo choose to make Cosette, considered a bastard child of sin, the most innocent, sacred character in the novel? Cosette comes to Valjean by chance, and he focuses all of his passions and efforts on her happiness. In the end, Valjean sacrifices his happiness for Cosette, demonstrating the extent of his adoration.

39. Reality of the Nuclear Bombs, *Yuka Tamagawa, Japanese*
Mentor: Fumie Bouvier, Japanese

Decreasing the number of nuclear weapons is the mission confronting international society today, especially after the events of 9/11. Japan, my country, is the only nation in the world that has experienced an atomic bomb used as a weapon. As a Japanese citizen, I received information about the atomic bombs' damage and power during compulsory education. Also during this time, I had the opportunity to attend the annual Hiroshima Peace Memorial Ceremony. I was not only able to see the damage and hear the atomic bomb victims' stories but I was also able to encounter first-hand many people from around the world who wanted to stop nuclear weapons. I would like to share the situation of the time Japan was bombed and its effects to this day. I would like to also bring awareness to the gap in consciousness between Japan and the international society including the U.S..

40. The Music of "The Lorax Project", *Corwyn Wyatt, Music*
Mentor: Larry Bitensky, Music

"The Lorax Project" is a theatrical reworking of the Dr. Seuss favorite, "The Lorax," written and directed by Centre senior Becca Finney. This presentation concerns Corwyn Wyatt's original score for this production. Aspects of the compositional process, techniques used, and thematic significance will be discussed as well as the score's dual nature which features a unique combination of acoustic and digital components. The presentation will also include audio selections of the score itself.

41. An Analysis of French and American Healthcare Systems--Why America will not move towards the French model that has been deemed the most effective healthcare system in the world, *Amy Dorsch, Government*
Mentor: Dan Stroup, Government

In 2000, the World Health Organization ranked the French healthcare system as the best in the world, with America's trailing behind at 37th. Although the French healthcare model has proven extremely successful in France, adopting the same model in America would be virtually impossible. I am not aiming to argue that the French healthcare system is the correct model of healthcare, but rather that for ideological, institutional, and political reasons, America would not be able to adopt such a system, despite its proven success. In order to effectively address domestic healthcare issues, the American government will have to stay within the framework of American institutions and values. "A country's health system can only succeed if it is consistent with a country's character," and, as I will argue, the French healthcare system is based on a set of values and institutions that are foreign to the American system.

42. The Effect of Partisan Polarization in Congress on the 2010 Health Care Reform, *Bethany Carson, Government*
Mentor: Dan Stroup, Government

This paper examines the Congressional processes involved in passing the 2010 Health Care Reform in order to determine the effect of partisan polarization of the United States Congress. I analyze the execution of legislative rules, intraparty bargaining, and the role of party leaders in order to display the existence and impact of polarization of the Republican minority against major legislation proposed by the Democratic majority. Data has been collected from Congressional documents, political journals, and texts by Congressional experts. Analysis shows that restrictive and biased rules are implemented to favor the majority in order to pass legislation in a fiercely polarized congress. Without minority cooperation, unethical bargains and pork barrel deals must be formed that are detrimental to the legislative process. This paper asserts that the polarized environment is transforming the legislative process from one of deliberation and compromise into a system that necessitates a substantial party majority to function.

43. Ildebrando Pizzetti: Opera, Modernism, and Fascism, *Kristen Baumgartner, History*
Mentor: Brianna Leavitt-Alcantara, History

The works of Ildebrando Pizzetti are rarely heard in opera houses today. Similarly, scholars have paid little attention to his compositional style in regards to the socio-political and cultural changes that were taking place in Italy in the early twentieth century. This presentation analyzes the complex role of Pizzetti in Italian opera in relation to philosophical and nationalist movements, including the rise of Fascism in Italy in the early 20th century by applying Eric Hobsbawm's model, as presented in *The Invention of Tradition*, and the distinction between the "politicization of aesthetics," and the "aestheticization of politics." The aesthetic ideology and compositions of Pizzetti show an important connection between music, culture, society, and politics that provide a way in which to re-evaluate the ideological structure and motives of avant-garde groups and their support for the Fascist regime, as well as the use of such ideologies by the party.

44. The Bias Effect of Leadership Style on Presidential Decision-Making: George W. Bush and the Iraq War, *Paige Burton, Government*
Mentor: Dan Stroup, Government

A President's leadership style and organization of their White House staff is not policy neutral and has a bias effect on the decision making process, exemplified by the George W. Bush administration and his decision to go to war in Iraq. It was due to the hierarchical structure of his administration, as well as his elite leadership style, that the decision to go to Iraq was made.

45. Ocular Complications of Cryptococcal Meningitis in Patients with HIV, *Heather Walls and Joan Duggan, M.D. Infectious Disease, University of Toledo Health Sciences Campus, Research Advisor, Biochemistry and Molecular Biology/Biology*
Mentor: Peggy Richey, Biochemistry and Molecular Biology/Biology

This is a report of two cases from the University of Toledo HIV Clinic in which patients went blind as a result of secondary Cryptococcal meningitis infection as well as a review of related literature. Nineteen cases of significant vision deterioration as a result of cryptococcal meningitis in patients with HIV were reviewed, including the two cases from Toledo. Of these cases, irreversible blindness occurred in 13 patients (68%), and 5 patients (26%) died of complications during treatment with no improvement in vision. The proposed mechanisms for vision loss are optic nerve infiltration, arachnoiditis caused by blockage of the arachnoid villi, and uncontrollable intracranial hypertension. Although cryptococcal meningitis is not the typical suspect for vision loss in patients with HIV, early detection of cryptococcal infection and aggressive treatment can help prevent long-term vision loss, while more conservative radiological diagnostic procedures and fundoscopic examination may be less reliable.

46. Comparative Healthcare Systems, *Jacob Edwards, Biochemistry and Molecular Biology/Biology*
Mentor: Peggy Richey, Biochemistry and Molecular Biology/Biology

My internship was a comparison between the rural healthcare system of a developing nation, Belize, and a developed nation, the United States. In Belize I served as an intern to Dr. Sherry Jones, a general practitioner in Columbia, Kentucky. We set up clinics in two rural villages, Gales Point and San Pedro Columbia. During this time I interviewed the ambassador of rural medical services and a Belizean physician about the healthcare system of Belize. I found that the healthcare problems in Belize were the lack of access to medical services, a low physician census, and poor sanitation. Upon my return to Danville, I shadowed Dr. Brian Ellis, who has a general practice serving patients from Boyle and surrounding counties. Rural healthcare systems in the U.S. also have a low physician census, but a greater problem is the affordability of and qualification for healthcare insurance.

47. Yeast Propagation Growth Curve, *Emily Hogancamp, Biochemistry and Molecular Biology/Biology*
Mentor: Peggy Richey, Biochemistry and Molecular Biology/Biology

In order to be cost efficient, many ethanol producers rehydrate packaged dry yeast purchased from a supplier and allow the existing population to undergo propagation. The process exponentially increases the amount of available yeast from the original stock, while at the same time decreases the number of units that must be purchased from the supplier. A shortened propagation will produce much lower numbers, while a longer than ideal propagation will waste valuable production time in the plant, thus a propagation curve should be generated to determine the minimal amount of propagation time that will produce a maximal population of yeast to add to the fermentation tank. Previous work had generated a yeast propagation curve

from 0-9 hours, and this project sought to extend the curve to include hours 9-20.

48. Prolactin and Nest Attachment, *Annie Roessler, Behavioral Neuroscience/Psychology*
Mentor: Melissa Burns-Cusato, Behavioral Neuroscience/Psychology

Ring neck doves engage in cooperative behavior, known as pair-bonding, during the reproductive cycle. The pair-bond is maintained from courtship, through incubation and brood, but dissolves after the chicks fledge. A pair bond may be the result of hormonal reinforcement associated with the nest. This experiment investigates whether prolactin, a hormone associated with incubation, has reinforcing properties in ring neck doves. A conditioned place preference (CPP) paradigm pairs a stimulus with a place. Use of the CPP apparatus allows for the determination of whether or not the hormonal state of the bird influences the formation of an association. Preliminary data suggests doves form a preference for the context paired with prolactin over a context paired with saline, indicating that prolactin has reinforcing properties. The findings support that prolactin might be a hormonal reinforcer involved in nest attachment and pair bonding.

49. A Construction of a Marian Narrative in the Tradition of Kierkegaard, *Topher Smith, Religion*
Mentor: David Hall, Religion

This paper, paired with a photograph, attempts to establish Mary, Mother of Christ, as a real woman also worthy of reverence. Through aesthetic and creative means, I attempt to establish her as a Kierkegaardian knight of faith, but also as simply a woman. This paper arose from a brief mention of Mary as another example of a knight of faith in Soren Kierkegaard's *Fear and Trembling*. The defining passage in *Problema 1* says, "...she is by no means a lady idling in her finery and playing with a divine child". In the paper, I construct my own interpretation (influenced by Kierkegaard) of the Marian story. Possible implications from this work include a reevaluation of the revered Mary in the Christian tradition and our interpretation of the supposed Mother of Christ.

50. Homosexuality in the Bible, *Sara Mishu, Religion*
Mentor: Lee Jefferson, Religion

Homosexuality is a controversial issue in today's American society. Even though society has become more accepting since the twentieth century, allowing equal rights to African Americans and women, the word "homosexuality" still holds a negative connotation for many people. One reason may come from the idea that the Bible does not promote same-sex relationships. In this presentation, I will attempt to show the problems with using the Bible as a platform against homosexuality. Applying the Bible as a source is problematic due to the origins of the word "homosexual." The supposedly "anti-gay" verses in the Bible further complicate the debate against the rights of gay Americans as the verses, read in their appropriate contexts, do not use homosexuality as their main target.

51. Khirbet Qana: A Case Study of Religious Identities and Interactions during the Byzantine Era of Pilgrimage to the Holy Land, *Katherine Dyche, Religion*
Mentor: Tom McCollough, Religion

This paper discusses the evolution of the archaeological site Khirbet Qana from a Jewish community to a largely Christian pilgrimage site over the course of the first centuries CE and into the Byzantine era. The material evidence suggests that Khirbet Qana (The Ruins of Cana) was associated with Jesus' miracle at the wedding of Cana- turning water into wine. However, beneath these later pilgrim settlements are also ruins of a first century Jewish village in the same location. Using archaeological data and comparisons to similar sites in the area, it appears that the massive influx of pilgrims to Khirbet Qana ended the existence of Jewish culture in the village, despite Jewish resistance to the growing Christian movement across Israel at the time. This case study impacts scholarly understanding of the way the Jewish-Christian dynamics in Byzantine Palestine developed and eventually altered the religious landscape of the area.

52. Persecution of Buddhism in Meiji Japan, *Jim Ransdell, Religion*
Mentor: Satnam Mendoza-Forrest, Religion

Despite having enjoyed the patronage of the state under the Tokugawa Shogunate (徳川幕府), by 1868, Buddhist temples and monks all over Japan found themselves under attack by the Meiji (明治) Imperial government which had assumed power just months earlier. Although several Buddhist doctrines fell directly in line with Meiji goals and policies, Buddhists suffered persecution as official favor shifted towards 'State Shintō' as a means by which Meiji authorities could promote loyalty to the Emperor. This, combined with rising Japanese hyper-nationalism, resulted in a concerted effort by local and prefectural authorities to

create a clear divide between Buddhism, a foreign religion, and Shintō, Japan's native son. From the time at which the Meiji Emperor assumed the throne in 1868 to the 1912 Conference of Three Religions (sankyō kaidō), Buddhism found itself on the wrong side of shifts in national policy.

53. The Unexpected Connections Between *Chéri* and *The Graduate*, *Alex Skees, French*
Mentor: Patrice Mothion, French

There is a long tradition of sharing cultural elements between France and the United States, elements of pop culture in particular. This is no different with two literary phenomena: *Chéri*, by Colette (1920) and *The Graduate* by Charles Webb (1963). Though they are separated by more than forty years, and written by very different authors, there are many similarities between the two novels. This presentation will underline their similarities and differences while also explaining the reasons for these elements. First, the two stories will be analyzed with a comparison of their plots, their social impact and their authors. Then, research studies on Colette will be applied to Charles Webb and *The Graduate* to clearly show that though there are differences, the similarities are impossible to ignore, and make for an interesting comparison of these two novels.

54. Seduction and Warfare: Conflict in a post-revolutionary France, *Megan Miller, French*
Mentor: Patrice Mothion, French

The year is 1799, a torn and besieged post-revolutionary France fends off the armies of England, Russia, Italy and Switzerland as well as a militant guerilla force of rural peasants in the west of France, known as the Chouans. The Chouans fight for God and king under the command of a brave young royalist, the Marquis de Montauran (the Gars). The Gars is a known lover of women and so the lovely Marie de Verneuil, a natural child of a noble is sent to seduce and arrest the enemy of the Republic. Through observation of the art of dress, poise and actions of Marie de Verneuil one finds the ageless craft of inspiring both love and lust dissected and appraised by the time honored writer, Honoré de Balzac.

55. Josephine de Beauharnais, and her influence on Napoleon, *Rachel Blank, French*
Mentor: Patrice Mothion, French

During the late eighteenth and early nineteenth centuries in France, Napoleon Bonaparte was greatly impacting the military and political aspects of Europe. While Napoleon is most recognized for his military brilliance, there are many aspects of his life that are worthy of examination. The relationship between Napoleon and his first wife, Josephine de Beauharnais, had a profound effect on his life. Josephine became a woman who guided Napoleon throughout his reign, and was able to influence his political decisions. My paper examines Josephine's influence on Napoleon's political decisions, in particular, his decision to reintroduce slavery in France in 1803.

56. The Vichy Paradox: "Liberté, Égalité, Fraternité" to "Travail, Famille, Patrie.", *John Blair, French*
Mentor: Patrice Mothion, French

In the rapidly-increasing field of Vichy France we have several studies concerning the ideologies of the well-known collaborators and Vichy's "National Revolution." Included therein is the disorder those ideologies brought on the country, and the growing opposition to both the ideas and the consequences. What we lack is a clear rendering of how those ideas became manifest in the minds of typical Frenchmen of liberal tradition. This question is important because the transition from the progressive liberal values of the French Revolution to the appreciably more traditional and agrarian tenets of Vichy seems counterintuitive. It is as though the French, save for the few who resisted, served the German cause despite themselves. France was not terrorized into surrendering their Jewish populations in the way that Poland had been. Yet, the first European nation to officially grant Jews legal rights often greatly exceeded the mandates imposed by the Nazis.

57. A Systematic Analysis of Animal Rights and Speciesism with relation to *Animal Rites* and *Silence of the Lambs*, *Kara Beer and Brian Anderson, Anthropology/Sociology*
Mentor: Phyllis Passariello, Anthropology/Sociology

Demme's classic American thriller *The Silence of the Lambs* is often recognized as a masterpiece of horror. Hannibal Lector and Buffalo Bill transgress against all social norms, and their transgressions are significant to the film's discourse on gender and class, both of which are important to the concept of species in relation to the film. In both *Animal Rites* and *Silence of the Lambs* it is easy to see the role of speciesism, as well as the concept of human and animal rights. These ideas can show us what Cary Wolfe, the author of *Animal*

Rites, is talking about when he means 'animal rites'. The characters in *Silence of the Lambs* allow Wolfe to express his animal-human continuum view, which depicts the idea of an animalized human and a humanized animal. Thus *Silence of the Lambs* is a quintessential example of both specieism and humanism in dramatic film.

58. "The Horror, the horror: music videos, pop culture and meaning.", *J.T. Leak, III, Anthropology/Sociology*
Mentor: Phyllis Passariello, Anthropology/Sociology

American youth are as precoccupied with pop culture as they are inundated by it. One side effect is their shaping of pop stars into larger -than-life icons. Music videos provide an easy venue for the pop ICONS and their producers to publicize their 'talents,' at the same time flooding the media with a barrage of ambiguous messages. As youth culture grows increasing fatigued by images and sounds once considered exotic, the ' ICONS' and their producers have responded with even more novelty and often outrageous intensity, pushing all kinds of boundaries and creating a semiotic kaleidoscope of messages. What are the implications of these messages for the artists, for the viewers and for the culture? Do these messages create or reflect values and worldview? Are music videos pushing the limits of creativity with an exciting new art genre or are they simply electronic background noise and colors?

59. *The Prospects for Project-Based Learning (PBL) as a Sustainable Model for Teaching, Kiara Roberts, Education*
Mentor: J.H. Atkins, Education

Some believe America's public education system is in a critical state. Project-Based Learning (PBL), a relatively new teaching model, is a possible solution to the system's problems. PBL activities present students with complex questions which are answered through research projects. PBL distinctively fosters the use of high-order thinking skills (HOTS.) Several Danville High School teachers have begun to integrate PBL activities into their curricula, mimicking San Francisco magnet school High Tech High. This nine-week study will assess whether High Tech High's model can be translated to the traditional American high school climate. Further, it will judge whether PBL can be used effectively across various disciplines. Qualitative and quantitative data will consist of on-site observations, interviews, and empirical figures. The success of PBL as a sustainable model will rely on its adaptability to the unique conditions of each American school, namely curriculum standards, budgetary constraints, technological availability, and socio-economic diversity.

60. *Castellers and Catalunya, Regina Basconi, Spanish*
Mentor: Julie James, Spanish

The castellers, an old Catalan tradition of human tower-building first recorded in the 18th century, has been deemed a world treasure by UNESCO. Based on the values of força, equilibri, valor i seny (strength, balance, courage and reason) these human towers are constructed by the Catalan people, often reaching several building-stories high, with what appears to be ease and simplicity but this is, in fact, a complex and risky activity. Upon further inspection, the four identifying characteristics mentioned above are not only espoused by groups of castellers but rather they are representative of Catalan society as a whole. After hearing the history, formation, and technicalities of the castellers, the audience will better understand the region of Catalonia, the national pride, the Catalan language, and the fight for independence that the people continue to this day.

61. *Internship at China Galaxy Securities Co., Yue Wu, Economics*
Mentor: Marie Petkus, Economics

During CentreTerm 2011, I did an internship at China Galaxy Securities Co. as an assistant financial analyst. Galaxy Securities Co. has been a leading securities company in the past decade in China and their research institute provides all-round professional research services to individual and institutional investors. I worked with several top analysts during my time there and assisted them in collecting data, performing statistical analysis, and developing narrative analysis in macroeconomic topics and securities company industry.

62. *The Effects of Workplace Smoking Bans on Smoking Prevalence: A State Level Analysis, Chelsea Stanley, Economics*
Mentor: Marie Petkus, Economics

This study investigates the effects of workplace smoking bans on smoking prevalence. Using a unique panel data set on state-wide smoking prevalence in each of the 50 states and Washington D.C., I analyze the

statistical and economic impact of a variety of governmental programs on smoking prevalence while focusing specifically on the effects of state-wide workplace smoking bans. Controlling for state and time fixed effects, as well as the possible lagged effects of smoke-free bans, I find that workplace smoking bans decrease overall smoking prevalence. The magnitude of this impact, however, makes the federal government's goal of reducing the national smoking rate from its current level to 12 percent by 2020 a hopeful aspiration. Nevertheless, workplace smoking bans, especially in conjunction with other statewide governmental initiatives, are a worthwhile endeavor in decreasing smoking prevalence amongst state populations.

63. Vehicular Fatalities and America's Youth: Does Driver Licensing Methodology Make a Difference?, *Chris Morris, Economics*
Mentor: Marie Petkus, Economics

For several years, traffic fatalities have been the leading cause of death for 15 to 20 year old individuals in the United States. Though many legislative measures have been taken to curtail teen traffic fatalities, the most significant has been the incorporation of Graduated Driver Licensing programs (GDLs). Nearly every state has instituted GDL laws, which are comprised of three stages: learner's permit, intermediate license, and full licensure. My research seeks to identify the effectiveness of GDL programs in reducing the number of fatalities among drivers ages 16-20. Data was gathered from the Fatality Analysis Reporting System Encyclopedia (FARS) for the years 1994 through 2008. The methodology used was a comparison of driver fatalities in the younger cohort to driver fatalities in an older cohort, while controlling for both time and state fixed effects. My results confirmed previous findings that GDL laws decrease traffic fatalities among teens with statistical significance.

64. Mega-events, Symbolic Politics, and Developing Countries: The Changing Nature of Power in the International Arena, *Ashton Hupman, International Studies*
Mentor: Lori Hartmann-Mahmud, International Studies

This research sets out to answer the question of why developing countries have taken such an interest in the bidding and hosting of mega-events. Using three case studies, my research focuses on India, South Africa, and Brazil and how these three middle-income emerging economies can be compared and studied in regards to the role of symbolic politics in hosting international sporting events, namely, the bidding process, the construction of mega-projects, and the overall cost/benefit analysis of hosting a mega-event. The conclusion of this paper will relate the three case studies and the important role symbolic politics plays in the bidding, hosting and outcome of sporting mega-events and how it furthers the notion of the changing power of politics and the emergence of soft power politics as an alternative policy option for a country's pursuit of global power, prestige and recognition.

65. Snake Alarm Responses in Barbadian Vervet Monkeys, *Ryan Will, Sam Morgan, and Katie Penn, Behavioral Neuroscience/Psychology*
Mentor: Brian Cusato, Behavioral Neuroscience/Psychology

African Vervet Monkeys (*Chlorocebus pygerythru*) possess differential alarm responses for snakes, leopards, and eagles. Young African vervets appropriately respond to predator and predator like stimuli though the mechanism through which vervets learn a predator specific alarm response is unknown. Vervet Monkeys are also found on St. Kitts and Barbados in the Caribbean. These groups have not experienced natural predation in the last 360 years, making them an ideal population to elucidate the ontogeny of predator specific alarm responses. Three troops of Vervets at the Barbados Wildlife Reserve were presented with three stimuli: a stick, a black rope, and a black rubber snake. One troop displayed the African Vervet snake alarm response. The implications of these results are discussed.

66. Maternal Influences on Parent-Offspring Kin Recognition in Japanese Quail (*Coturnix japonica*), *Emily Gregory and Kendra Montejos, Behavioral Neuroscience/Psychology*
Mentor: Melissa Burns-Cusato, Behavioral Neuroscience/Psychology

Discriminating relatives from non-relatives increases an individual's reproductive fitness by allowing adult quail to provide resources only for their offspring and chicks to avoid dangerous interactions with non-relatives. Japanese quail chicks and parents were tested for parent-offspring kin recognition three days after hatching. Although adult males showed no offspring recognition, the female quail that displayed maternal behaviors showed evidence of recognizing identifying related chicks. Chicks preferred their mother if she had displayed parental care. Thus, parental care may be necessary for kin recognition to occur. In a second experiment, daily injections of prolactin hormone, which correlates with incubation behavior, failed to

induce parental care behavior. Future research will explore other ways of inducing maternal care behaviors to determine the role of maternal care in parent-offspring recognition. Understanding the mechanism for parent-offspring kin recognition can aid in developing better captive breeding techniques for preserving endangered bird populations.

67. The Effects of Biofeedback on Performance of a Visual Attention Task, *William George, Lindsey Clark, Myaa Lightfoot, and Matt Williams, Behavioral Neuroscience/Psychology*
Mentor: KatieAnn Skogsberg, Behavioral Neuroscience/Psychology

This study examined the effects of biofeedback on performance of a visual attention task. Researchers and practitioners in a subfield of biofeedback, referred to as neurofeedback, have suggested that learning to control certain brain activity may improve attentional abilities. We hypothesized that participants who exhibited an ability to control their brain waves during a neurofeedback training session would perform better than other participants on our visual attention task, called the Stroop task. In our study, the experimental group completed the Stroop task, followed by a neurofeedback training session, and concluded with another completion of the Stroop task. Conversely, an active control group underwent a biofeedback training session in which they tried to maintain a steady respiration rate. In addition, there was a passive control group that watched a video instead of completing a training session. We are analyzing both the behavioral aspects of the results (changes in reaction time on the Stroop task) as well as the biological aspects (changes in EEG data of each participant). The behavioral results of this study will be discussed.

68. Scoring with NOE Restraints Improves Protein Structure Results, *Louesa Akin, Jens Meiler and Brian Weiner of Vanderbilt University, Chemistry*
Mentor: Jennifer Muzyka, Chemistry

Computational modeling can provide a way for structural biologists to predict protein structures when traditional experimental methods fail. BCL::Fold, a template-free protein structure prediction algorithm is currently under development. This application is capable of predicting protein structures for both soluble and membrane proteins with or without EPR and cryo-EM experimental restraints. In order to incorporate NMR restraints into the current BCL::Fold framework, a scoring function was introduced to evaluate predicted models versus the experimentally determined restraints. The effect of utilizing NMR restraints on the accuracy of the BCL::Fold algorithm was then assessed by predicting the structure of a benchmark protein with and without restraints. More native-like structures (structures that have an RMSD100 of less than eight angstroms) were generated when using NOE restraints, suggesting that BCL::Fold will be a useful tool for predicting protein structures when NMR restraints are too sparse for traditional structure determination methods.

69. Virtual Screening of MurA: Elucidation of Potential Inhibitors, *Zachary Sweeney, Chemistry*
Mentor: Jennifer Muzyka, Chemistry

Increasing bacterial resistance to modern antibiotics has already resulted in the practical decommissioning of several widely prescribed pharmaceuticals such as Fosfomycin. There is an urgent need for the expedient elucidation of potential antibacterial compounds that can be pharmacologically optimized for clinical implementation. Virtual screening of appropriate enzyme targets allows for the efficient analysis of the binding strengths of various lead-like ligands that could act as potential inhibitors of critical cellular processes. In this study, the MurA enzyme responsible for catalyzing the first step of cell wall biosynthesis in *E. Coli* was analyzed via virtual screening using DOCK. The binding energy of the tetrahedral intermediate and the binding energies of over 1,000,000 commercially available lead-like ligands were calculated and compared using the aforementioned molecular docking program on the Teragrid supercomputing network. Numerous ligands (1300) of the 1,000,000 screened yielded lower binding energies than the tetrahedral intermediate of the reaction catalyzed by the MurA enzyme and could potentially inhibit enzymatic activity. Future work will involve performing molecular dynamics calculations on the potential inhibitors to obtain a more accurate calculation of binding energies. Virtual screening shows great promise as a means of contending with the speedy evolution of bacterial pathogens and is rapidly becoming a standard practice in pharmacology.

70. Metabolomic Screening, *Brian Hodge, Chemistry*
Mentor: Kerry Paumi, Chemistry

Yeast Cadmium Factor 1 (Ycf1) is an ATP Binding Cassette (C-subfamily) transporter that resides in the vacuolar membranes of Yeast cells. Ycf1 helps sequester harmful toxins that build up in the cell, thus

allowing it to withstand extremely toxic environments. The reason we focus on the yeast YCF1 transporter is to increase our understanding of the human homolog: Multi-drug Resistance Associated Protein-1 (MRP1). ABC transporter function is highly regulated in eukaryotic cells, primarily through post-translational modification. Recently experiments have shown that Ycf1 contains multiple residues, that when phosphorylated, can either increase or decrease transporter function. My research focuses on a kinase protein: EUG1. This kinase is thought to phosphorylate Ycf1 when it is stationed at the Endoplasmic Reticulum, thus allowing it to release and be transported to vacuolar membranes. Understanding negative regulation of Ycf1 (and MRP1) may lead to novel techniques in reducing multi-drug resistance found in cancerous cells.

71. Study of the Yeast Cadmium Factor 1, Ycf1p, and the Protein Interactor, Eug1p, *Brian Hodge, Chemistry*
Mentor: Kerry Paumi, Chemistry

Bread yeast (*Saccharomyces cerevisiae*) is an ideal model system for the study of membrane transporters because it is easily manipulated at the genetic and biochemical level. *S. cerevisiae* express a membrane transporter protein, Ycf1p, which plays an important role in cellular detoxification for the organism. Ycf1p is the yeast homologue of MRP1, a human membrane-bound transporter with similar cellular detoxification functions that is also key component in drug detoxification. We have created key genetic variants designed to study the protein interactions of Ycf1p with Eug1p, an endoplasmic reticulum protein, to determine the extent of interaction. It is our hope that though the mapping of Ycf1p-protein interaction we will gain valuable insight into functional regulation of the homologous human membrane-transporter protein, MRP1.

72. Using topology to protect a forest?, *Evan Shirley and Ibrahim Jadoon, Math*
Mentor: Marian Anton, Math

To safeguard a forest against fire we enclose the area within a sensor fence and spread a great number of cheap sensors inside. Each sensor senses fire within its own vicinity and broadcasts signals to a central facility. How do we guarantee that no spot in the forest evades detection? We will show that the answer is topological and elementary.

73. Cracking the K13 Elliptic Curve Code, *Ryan Curry, Math*
Mentor: John Wilson, Math

Elliptic curve cryptography has come to play an integral role in our lives, from protection of government secrets to secure online shopping. But under what conditions does that security break down? Our work has explored the patterns and potential vulnerabilities that render certain curves unfit for such use. Particularly, in this talk we will outline an algorithm designed to decrypt messages encoded using 13-bit Koblitz curve keys. We conclude with a reassuring look at the secure curves used in practice.

74. Creating a Personal, College Endeavor, *Brantley Gunn*
Mentor: Patrick Noltemeyer

I have recently created a website called Centre Central. It is a project funded by the Bonner Program and is made by Centre students for Centre students. I believe every Centre College student should have access to opportunities available in the surrounding community in a convenient and organized website. With access to this resource, any and every Centre College student may easily utilize their talents and abilities to the fullest extent. In order to make this vision a reality, the people of Centre Central seek out events in the Centre College and Danville community. These events are then organized into certain categories and uploaded onto a public calendar that anyone can access.

75. Praying in the Garden: Reimagining Kentucky Culture Through A Trial of its Place-Based Literature, *Caroline Stephens*
Mentor: Brett Werner

In Leslie Marmon Silko's Ceremony, the main character Tayo struggles to live in community with his environment. The infiltration of white American culture separates him from the reservation landscape. Tayo finds a spiritual equilibrium by reimagining Laguna ritual. In Kentucky, reckoning with the destructive forces of mountaintop removal and industrial agriculture, I look toward writers Wendell Berry and Silas House for cultural guidance. Both offer different approaches to cultural recreation in their novels. Wendell Berry's writing shows a way of connecting with the land through an archaic method of farming, less adapted to contemporary cultural norms. In The Coal Tattoo, Silas House tells the story of an Appalachian family struggling with a changing landscape. This family is able to reimagine culture in their home place on Free

Creek. Their story serves as an example of an alternative way to interact with nature through the reimagining of culture.

76. Physically-Derived Cellular Automaton Models of Snow Crystal Growth, *Everett Boyer, Physics*
Mentor: James Kelly, Physics

Attempts to simulate the growth of snow crystals from water vapor on a computer have met with limited success until fairly recently. In the past few years new models based on local cellular automata have shown growth features that qualitatively match the characteristics of real snow crystals quite well. At the same time such models have been criticized for being largely ad-hoc, incorporating little known physics and many free parameters. This talk outlines the cellular automaton modeling technique for crystal growth and our attempts to insert more physics and reduce the number of free parameters while preserving the qualitative agreement.

77. Metal Grating-Waveguide Resonators and Phase-shifted Structures, *Jerry Yang, Physics*
Mentor: Jason Neiser, Physics

In the last decade, silicon has received a lot of attention as a material in which to build quality optical structures, and one dream is to fabricate useful optical structures on the same chip that contains electronics. The interactions between light and metal grating-waveguide resonators built in silicon were studied in this research. A grating-waveguide is made by fabricating a metal grating (only a few tens of nanometers thick, with a period on the order of the wavelength of light) atop a crystalline silicon waveguide layer less than one micrometer thick. Phase-shifted devices which contain a periodic defect at every 20 gratings were analyzed too. The grating-waveguide was illuminated by light from a broadband source at normal incidence and the reflectance spectrum was measured. The experimental reflectance spectra were compared to the calculated spectra found via rigorous coupled-wave analysis.

78. Development of Numerical Representation in Children, *Jennifer Bohnert, Psychology*
Mentor: Jennifer Asmuth, Psychology

Results from previous studies suggest that younger children may have a non-linear representation of number, where small numbers are relatively easy to distinguish and are represented fairly linearly in psychological space and larger numbers are represented more approximately, with the intervals between "compressed." As a result, children tend to represent smaller numbers as equidistant while larger numbers are increasingly "closer" to one another. This pattern has commonly been interpreted as a logarithmic representation of number. In this experiment, we are investigating whether this non-linear spacing stems from a true logarithmic representation of number or is rather a by-product of previous methodology. In the current study, we investigate whether Cantlon's linear-scale model (2009) is a more appropriate fit of the data: that the "noise" or inaccuracy of numerical mapping increases proportionally with number, giving rise to a pattern of data that can be interpreted as either logarithmic or linear-scale.

79. Voir Dire, Change of Venue, and "Legal Desirability": Hidden Jury Bias in High PTP Cases, *James Melloan and Andrew Augustus, Psychology*
Mentor: Mykol Hamilton, Psychology

This study demonstrates that individual voir dire underestimates prospective jurors' bias toward guilt in high PTP cases. We compared prospective jurors' pretrial guilt opinions in individual voir dire, where social desirability pressure is high, to opinions in an anonymous survey where pressure is lower. Jurors were two-and-a-half to six times more likely to say Guilty in the survey than in voir dire. Also, expressed opinions on the survey differed depending on question wording, probably also due to differing degrees of social desirability pressure. The study has important implications for change of venue surveys and jury selection in high PTP cases.

ABSTRACTS: MUSICAL AND DRAMATIC PERFORMANCES

80. Centre College Early Music Ensemble, *Daniel Walton, Corwyn Wyatt, Jason Greene, Jimmy Kalb, and Scott Albertine Music*
Mentor: Nathan Link, Music

The performance repertoire of many “classical” music ensembles covers a surprisingly limited time period. Major symphony orchestras and chamber groups take the bulk of their material from the late Baroque period onward, ignoring the rich body of work from the Medieval, Renaissance, and early Baroque eras (over 650 years of music). Our ensemble seeks to bring this underappreciated music into the public ear through the preparation and performance of selected works. The group also composes arrangements of these melodies in period style and encourages the development of improvisation as demanded by early performance practice. Medieval dances, Renaissance divisions, and early Baroque suites are all included in the ensemble's repertoire. We hope that this performance provides a broad overview of the variety present in early music and encourages listeners to further explore its beauty.

81. Live Gospel Recording, *Curtis Donald, Jr., Music*
Mentor: Daniel Worley, Music

Donald Jr, C.O. (Performer). (2011). Speak To My Heart [Originally recorded by Donnie McClurkin (1996)]. [Medium of recording: Record] Danville, KY. This audio recording is a portion of the chosen coursework for Centre's Digital Music Technology class. The aim of this project is to produce songs that fit the mold of the traditional gospel genre by way of potent and thorough embellishments. The embellishments serve to create an aesthetic capstone that resonates, albeit digitally, exactly as a live performance would. The live sound quality is achieved by choosing the proper instrumentation and by using the various equalizing techniques available digitally. There are a myriad of measures that are taken—through “mixing and mastering”—to attain the desired sound quality. This project originated from an innate desire to create aurally pleasing audio that resembles the types of full orchestration previously used in gospel music.

82. A Sophomoric Composition for Classical Guitar, *Matthew Short, Music*
Mentor: Daniel Worley, Music

This piece is my first attempt at composing polyphony for classical guitar, mainly inspired by the lute compositions of J. S. Bach and John Dowland.

83. Evoking It Through Accident, *Albert Hall, Music*
Mentor: Daniel Worley, Music

The music that will be performed represents an endeavor to create a piece of music that aspires to be both theatrical (in the literal sense) and sacred, a blending of modern electronic equipment and shamanistic introspection.

Using a decade-old sampler and rapidly aging synthesizer, droning soundscapes will be created that channel Morricone as much as Mawlānā.

Two concepts were used as guides during the process of composition. The first is the idea that we are media-beings, in touch with a world of electronic sounds and signals. The second is the idea that between this electronic world and ourselves, a communion occurs. Thus every synthesizer becomes a Ouija board and every fuzzy hum a sign.

84. The Art of Aerial Silks, *Kelley Bell, Becca Finney and Chelsea Apple, Drama*
Mentor: Matthew Hallock, Drama

Aerial silk dancing (also known as aerial fabric dancing) is a physically challenging and unique creative art in which the performer climbs and dances on a vertically suspended length of fabric. This type of dance is visually stunning and gravity-defying—it breaks down traditional boundaries (such as needing a floor) and creates new challenges for the performing artist.

This presentation is designed to introduce audiences to the unusual and challenging art of aerial silks and its significance in the world of dance. We will present a brief history, analyses of technique and choreographic elements, a performance of a routine-in-progress and a question and answer session.

ABSTRACTS: POSTER PRESENTATIONS

85. Biochemical Characterization of MurA in *Escherichia coli* in the presence of inhibitor, *Kyle Forte and Katie Lentz, Chemistry*
Mentor: January Haile, Chemistry

The widespread use of antibiotics to treat bacterial infection has selected for antibiotic resistant strains of bacteria. Fosfomycin is an example of a naturally occurring broad spectrum antibiotic that has become less effective because of increased bacterial resistance. Fosfomycin inhibits synthesis of peptidoglycan, a structural component of the bacterial cell wall, by covalently binding to the phosphoenolpyruvate binding site of the enzymes MurA and MurZ, both essential enzymes in the peptidoglycan synthesis pathway. The MurA gene has been cloned and transformed into *E. coli* for overexpression and the purification of the protein MurA. MurA enzymatic activity with the appropriate substrates is detected by monitoring the release of inorganic phosphate with malachite green as an indicator. Continued research on MurA activity in the presence of putative inhibitors is being performed.

86. Genetic Disparity Between Populations of Caribbean Gnathiids, *Sarah Wilson, Jill Krier, and Whitney Sears, Biology*
Mentor: Chris Barton, Biology

In this research, the genetic structure of gnathiid populations (*Gnathia* spp) collected from several different sites (Guana, Culebra, and St. John) in the Caribbean was investigated. PCR was used to isolate DNA from the ITS 2 gene region using Forward and Reverse primers from all sampled gnathiids and sequences were obtained. All of these sequenced gene regions were compared using Geneious™. Intrapopulation differences were found for Guana and Culebra populations. Interpopulation differences were also found, with Guana and Culebra being most similar. These results suggest that there are possibly two different haplotypes represented in the Caribbean gnathiid populations. Future research regarding variation due to sex-linked genes should be completed. More samples from all sites and some additional Caribbean locations should be run to fully understand population genetic structure of these gnathiids.

87. Redefining Leadership: What it Means to be a Servant Leader, *Travis Adams, Meghan Hawthorne, Julie Springate and Jordan Shewmaker, Education*
Mentor: Sarah Murray, Education

Traditionally, a leader is perceived to be someone of high authority, who spends their time directing individuals beneath them in a particular organization. While this idea may be accurate in a sense, we have found that “true” leadership involves the act of service. As a result of our readings in numerous texts, including *7 Habits of Highly Effective People* and *Soul of a Citizen*, along with insightful dialogue with community leaders and service projects, it has become clear that servant leadership involves a very unique skill set. This presentation highlights the particular skills needed to be an effective servant leader, while readdressing the traditional notion of leadership. We will discuss the implementation of our leadership research within our personal service projects, and how these experiences have allowed us to create a more valid definition of leadership.

88. Dramaturgy for Tom Stoppard's *Arcadia*, *Whitney Brown, Drama*
Mentor: Anthony Haigh, Drama

Tom Stoppard's *Arcadia*, which is set partly in the early nineteenth century and partly in the present, is concerned with such topics as the Enlightenment, Romanticism, aesthetics, and physics. As the dramaturge for DramaCentre's Fall 2010 production of *Arcadia*, it was my responsibility to conduct research for the actors and the director throughout the production process. This allowed them to better understand the characters and the time period in which the play is set.

My principal sources for information were articles and books about the early nineteenth century, nineteenth century literature, and nineteenth century visual art. My research led the actors and the director to understand the different character's relationships with each other, as well as their relationships with the world around them. This unified understanding of the historical, artistic and cultural world of *Arcadia* fostered a unified, informed production.

89. Factors that Affect Visitors to Cleaning Stations in San Salvador, Bahamas, *Sarah Wilson, Sarah Humphries, Christina Vincent and Jacquie Kalugyer, Biology*
Mentor: Brian Storz, Biology

We investigated factors affecting the mutualistic relationships within tropical fish cleaning stations. Cleaning stations are a mixture of organisms attempting to remove ectoparasites from other visitor fish. We recorded the number and species of cleaners and cleaning-station visitors from 26 cleaning stations spread out over six different coral reefs. We found a positive correlation between the number of cleaners in a station and the number of visitors. There also seemed to be a correlation between the presence of Fairy basslets and/or Spanish hogfish—both of which have purple/yellow color combinations—and the highest number of visitors. Thus, this color combination presumably acts as an attractant to potential cleaning-station visitors. This finding warrants further experimental investigations to determine the relationship between color and visitor traffic.

90. Strategies for Teaching Primary Math , *Mary Kathryn Dilisio, Education*
Mentor: Sarah Murray, Education

Common problem areas in mathematics for primary students include concepts of money, time, and place value. The intent of this action research project is to assist five struggling students in these popular areas for difficulty. These students were assessed on the concepts of money, time, and place value. The pre-assessment determined which of the three areas each student requires further assistance. Each mathematical topic will be covered over consecutive one week time periods, with students working 60 minutes a week for three weeks. At the end of each week, the students will be assessed to see if the specific strategy used during the week to teach the concept was successful. At the end of the three-week period, the students will be given a final assessment; it is hoped that the students will acquire proficiency in money, time and place value.

91. Determinants of Average Attendance for Major League Baseball Teams, *Kyle Binder, Economics*
Mentor: Bruce Johnson, Economics

This paper examines possible factors in the variation of average Major League Baseball attendance among all 30 major league baseball teams over the five seasons from 2006 to 2010. Major League Baseball teams are concerned with making a profit, and higher attendance numbers lead to higher profits. In this paper, a panel data approach is utilized to include data from the same 30 teams over the five seasons. Using a fixed effects model, the effects of various independent variables on the average attendance of an individual team in a given year are tested. Among the variables tested, the team's winning percentage in the given year, the winning percentage in the previous year, and whether or not the team made the playoffs in the previous year were all shown to have significant effects on the average attendance variable.

92. The Influencing Factors on Heart Disease Mortality Rates, *Katie Herren, Economics*
Mentor: Bruce Johnson, Economics

Heart disease is the most prominent cause of death in the United States, taking the life of one American every 34 seconds. This means about 2,500 Americans die from heart disease every day. Kentucky has the 8th highest mortality rate due to heart disease in the United States. By running a series of regressions using various data, I obtained a model that attempts to explain the factors that are significant contributors to heart disease mortality in Kentucky. The data were demographical, economical, and behavioral, and were given as percentages by county. While I predicted that several of the behavioral factors, such as smoking, obesity, and degree of inactivity would be the most significant causes of heart disease mortality, my results indicated that the demographic factors were more significant. Continuing research will help to decide if there are innate problems in the model, but the results are interesting nonetheless.

93. Multi Species Snapper Schooling, *Taylor Childress, Nicole Webb, Meredith Mayfield and Elizabeth Fenwick, Biology*
Mentor: Brian Storz, Biology

We investigated the composition of schools with snapper species to understand the factors that determine the formation of multi-or single species schools, as well as which species lead multi-species schools. From a total of thirty seven schools scattered across three reefs, we recorded the number of species in a school, school size, the lead species and other school-behavior observations. We found a correlation between the number of fish and the number of species in a school and that some snapper and non-snapper species were predominantly present in the single-species. We found no statistical significance for leaders in multi-species schools of varying sizes.

94. Using Metacognition Strategies to Master Mathematical Concepts, *Mary Diemer, Education*
Mentor: Sarah Murray, Education

In today's classroom more and more teachers are using metacognition strategies to help their students to master basic mathematical concepts. My research will focus on one 2nd grade student who, despite receiving every possible service her school has to offer, still has not mastered early mathematical skills. I will be working one-on-one with the student using metacognition strategies and hands-on activities. By asking the student to think about her thinking I hope to help her to better understand the mathematical concepts and improve her number sense. I will assess her progress through weekly assessments and anecdotal notes.

95. Determining the Salary of Major League Baseball Hitters, *Jordan Ellis, Economics*
Mentor: Bruce Johnson, Economics

This paper examines the effect of several variables in baseball and how the variables affect the salary of Major League Baseball hitters. In this project the results were obtained from three different forms of data: baseball statistics, player salaries and player contract information. The project was analyzed through SAS with eight variables. The final model states some key factors which can help explain batter salary including: the star power of the player, the amount of runs created, the experience of the player, whether or not the player is eligible for arbitration, the league of the player and the winning percentage of the team in the previous year. For future research, further development in the RUNSCREATED statistic could improve the effect of how a player's offensive production affects salary. In conclusion, this research can be valuable to teams in determining which free agents to sign in the free agent market.

96. Conical Nanopores as Light-controlled Switch, *Willie Polio and Ben Slone, Chemistry*
Mentor: Jeff Fieberg, Chemistry

The effectiveness of a light-controlled switch for regulating the flow of ions through a conical nanopore was investigated. The conical nanopore was prepared by chemically etching a single ion damage-tracked polyethylene terephthalate (PET) membrane. The pore was then gold plated and functionalized with azobenzene thiol, a molecule that undergoes a reversible isomerization when exposed to ultraviolet light (trans to cis) and visible light (cis to trans). The light-induced changes in conformation served to open or clog the pore, thus sterically regulating the flow of ions. The current established through the pore was measured by a picoammeter. Results from previous research in the summer were reproduced as a decrease in current was observed upon exposure to ultraviolet light. The current was restored following exposure to visible light. Further investigations into improving the efficiency and determining the long-term viability of the membranes needs to be undertaken.

97. The Role of the Membrane-bound Protein Transporter, Ycf1p in *C. glabrata* Viability, *Stephen Howell, Chemistry*
Mentor: Kerry Paumi, Chemistry

The membrane bound transporter protein, MRP1, is believed to be responsible for multi-drug resistance (MDR) in cancerous cells, thus limiting the effectiveness of chemotherapy in cancer patients. Similarly, a homologue of MRP1, Ycf1p, also has been found in an alternative strain of yeast, *Candida glabrata*. *C. glabrata* is a clinical form of yeast and is commonly found in infections found in at IV sites in immune-compromised patients (those patients with HIV or advanced stages of cancer). Our work focused on creating a genetic variant of the *C. glabrata* yeast in which the gene for Ycf1p has been removed or "knocked out" in order to study the role of our transporter protein, Ycf1p, plays in the viability of the yeast in the clinic and the possibility of identifying a target for future treatment regimens.

98. Refinement of MurA Structure, *Emily Hogancamp, Chemistry*
Mentor: Jennifer Muzyka, Chemistry

In order to combat increasing antibiotic resistance, it is necessary to continually develop novel drug inhibitors. MurA is an enzyme involved in bacterial cell wall synthesis, and is therefore critical to bacterial life. As such, the enzyme is a good target for bacterial inhibitors. While the overall structure of MurA is available, the positions of some amino acid residues are unknown. In order to determine the exact position of these residues, better elucidate the MurA structure, and aid in the discovery of bacterial inhibitors, the Deep View protein modeling computer program was employed. Deep View allows users to alter atom identities and positions and refine protein structure to give the lowest energy conformation.

99. A comparison of mutability across entity and relational nouns, *Sarah Cao, Psychology*
Mentor: Jennifer Asmuth, Psychology

This study explores the psychological properties of relational nouns—a kind of noun defined primarily by extrinsic relationships to other entities (e.g. a teacher teaches something to someone). In comparison, entity nouns are defined primarily by intrinsic properties (e.g. a dog has fur, four legs, a tail, etc.). Research from prior studies suggests that relational nouns share many properties with verbs (e.g., they take arguments, are acquired later, and are remembered poorly). In this experiment, we investigate differences in mutability, or semantic change across different contexts, in relational and entity nouns. Mutability is measured by participant success in “tracing back” a paraphrase to the original word from which the paraphrase was generated. We predict that because the meaning of relational nouns changes more across different contexts than the meaning of entity nouns, participants will be more successful in tracing paraphrases back to entity nouns than relational nouns.

100. Thermally Induced Spadefoot Plasticity, *Cailynn West, Biology*
Mentor: Brian Storz, Biology

A number of studies have investigated the effects of temperature on tadpole body plasticity, but most studies used temperate and/or montane species as their focal animals, which are not naturally exposed to high temperatures during development. We examined the potential effects of temperature on body shape plasticity in a desert-adapted anuran and predicted that desert-adapted species would show developmental canalization (i.e. no shape plasticity) at high developmental temperatures, and potentially all temperatures, because they have evolved to develop in high-temperature ponds. *Spea multiplicata* tadpoles (N=461) were hatched in the lab and exposed to one of three temperature-cycling regimes, cold (22-24.9°C), intermediate (23.8-32.6°C), or hot (24.4-37.6°C). At mid-development, tadpoles were removed from treatments, preserved, and imaged. Geometric morphometrics was used to quantify potential shape differences among temperature treatments.

101. My Project to Increase Automaticity in Math for Second Grade Students, *Sarah Ronald, Education*
Mentor: Sarah Murray, Education

Elementary School students work in math to develop several skills. Automaticity is a valued skill that teachers work to build with students. This includes the quick recall and fluency of math facts. During my six week project, I worked with six chosen second graders to build strong automaticity with simple addition problems. The students were given several one minute tests of 25 problems. Each test focused on adding a specific number; the first test had one added to each single digit number. Students had to master each test by getting all 25 correct in a minute before going to the next level. Flashcards were implemented when students needed help with problems when a test wasn't passed. The goal was to build strong addition skills with automaticity, using the additional practice outside of the general classroom. The results will show how well the flashcards improved skills and if automaticity was increased.

102. Ephraim McDowell Health Community Service, *Trinity Hochstetler, Chemistry*
Mentor: January Haile, Chemistry

Ephraim McDowell Health Community Service Department in Danville, Kentucky provides preventive care in Boyle and surrounding counties based upon community health needs assessments. The organization focuses on faith-based community nursing, integrated school health programs, and nutrition and physical activity education for young children. In addition, health screenings are performed for those at risk for cancer, obesity, and heart disease. As a Community Service intern, my main responsibilities include working with the Heart Health program and VERB summer program for children. Information on these programs will be presented to the Centre community in April, 2011.

103. An Investigation of Bulgarian Solitaire, *Kelley Lynch, Mathematics*
Mentor: John Wilson, Mathematics

In the August 1983 issue of *Scientific American*, Martin Gardner introduced his readers to Bulgarian Solitaire. The game begins by placing N cards into a finite number of stacks (N may be any positive integer). A “move” in the game consists of taking one card from each existing stack and combining the removed cards to form a new stack. If N is a triangular number ($N=1+2+3+\dots+k$) arranged in any original configuration whatsoever, the configuration of the cards will eventually reach a point where it is no longer changing. For other values of N the configuration will, at some point, begin repeating previous configurations, thus creating a cycle. We will investigate patterns that arise in cycle length and moves required to reach a cycle in an attempt to predict each of these for a given number of cards and initial configuration.

104. Food Knowledge and Preferences, *Madri Faul, Psychology*
Mentor: Jennifer Asmuth, Psychology

As part of a larger study investigating food knowledge and choices in the greater Danville community, the current study explored the food attitudes of the Centre College population and tested the generalizability of the Food Choice Questionnaire (Steptoe, Pollard & Wardle, 1995). We tested the factors of health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern. Descriptive statistics and factor analysis showed that sensory appeal was the most important factor to the Centre population and that three items did not correlate well with the other items in their factors. While the survey may be an effective instrument in other populations, these differences should be taken into consideration.

105. Effects of Spelling Progress Charts on the Spelling Accuracy/Improvement of First Grade Students, *Lydia McCollum, Education*
Mentor: Sarah Murray, Education

Spelling is an integral part of language instruction for every student. It is essential in helping students master the basics of reading and writing. In the school setting, spelling problems rank as one of the most common difficulties. For this reason, I have implemented a system of spelling progress charts to monitor student achievement in a first grade class at Jennie Rogers Elementary. The charts are designed to record and monitor students' progress on weekly spelling tests. Each week, after the spelling test, students are given a chart with eleven smiley face boxes. For each correctly spelled word, they fill in one smiley face. This 12-week action research study will present both the teachers and the students with quantitative data offering valuable insight into the pupils' spelling progress. It is hoped that providing students with this visual feedback will motivate them and lead to spelling improvement.

106. Math Intervention: Closing the Gap, *Jenny Young, Education*
Mentor: Sarah Murray, Education

My research will focus on working with a middle-achieving third grade math student in order to boost her performance level in math. This will be completed through the implementation of one-on-one tutoring and specific math strategies with an emphasis in story-problem comprehension. Based on recommendations by the math interventionist and my supervising teacher, I will work two days a week individually with this student. Diagnostic testing in December by the school and a pre-assessment by me in February showed that this student indicated average overall performance in process and application. Success with this project will be measured by a summative assessment of story-problem comprehension, improvement in standardized test scores at the end of the year, and a follow-up interview with my supervising teacher.

107. Restoring a Kentucky Prairie: GIS Analysis of Native and Invasive Non-Native Plant Species, *Pavan Podapati, Biology*
Mentor: Anne Lubbers, Biology

Prairie habitats in Kentucky exist today only as remnants which contain a mixture of native and non-native species. Overall prairie plant community health can be assessed by surveying population sizes of rare native prairie plant species. This survey assessed the within site distributions of *Lespedeza capitata*, a special concern fire-adapted native forb, and *Lespedeza cuneata*, a widespread fire-adapted exotic invasive in a remnant barrens ecosystem. GPS transect surveys were conducted on both species of plants. The mean distributions of these plants in the remnant were 1 plant per 242.3 ft² for *L. capitata*, and 1 plant per 18.0 ft² for *L. cuneata*. *L. capitata* was restricted to growing in small areas, while *L. cuneata* grew densely across the fragment. Literature on *L. cuneata* states that this plant poses a direct threat to *L. capitata* populations. Herbicide treatments and prescribed burns may be required to curtail the growth of *L. cuneata*.

108. Unmixing Population Genetics Data, *Jasmin Kaeser, Biology*
Mentor: Chris Barton, Biology

While there are several methods currently available to study population ancestry, new models may help increase the accuracy of findings and decrease the amount of time it takes to determine ancestry. Recent work using population genetics tools to look at tumor cell growth resulted in the adoption of a new method of data interpretation known as unmixing. This method was used in tumor research to determine ancestral cell states in tumor evolution and may have similar applications for human populations of mixed ancestry. The purpose of this research is to determine whether unmixing is a valid tool for looking at single nucleotide polymorphisms (SNPs) to determine the ancestry of populations and to maximize the usefulness of this method for population

genetics. In order to accomplish this, we used MatLab to test data gathered by the HapMap Project, an international survey of human genetic variation, and simulated populations created with ms, a population simulator program. We looked at the effectiveness of unmixing under different parameters such as number of individuals included and the amount of SNPs, as well as with different admixed populations with multiple ancestries. We found that the standard deviation around the central point of ancestry increased as the number of SNPs analyzed increased, but found no similar correlation with the number of individuals analyzed. We also found that unmixing handles three pure populations best, but still has a low error rate when given data with two populations admixed together. It does best with smaller generation sizes, with error increasing with generation size. If two admixed populations are analyzed together this increase is less linear, but the error size is only slightly higher overall. So unmixing can handle admixed populations, but further research is needed to see to what extent this is true.

109. The Effects of Alcohol on the Stress Responses of Japanese Quail is Dose Dependent, *Rachel McClain, Psychology*

Mentor: Brian Cusato, Psychology

Alcohol's effect on stress responses has been investigated in a wide variety of species including rats, mice, and humans, but the present experiment was the first to investigate such effects in Japanese quail (*Coturnix japonica*), a terrestrial galliform species. Groups of male and female quail consumed normal drinking water, and low and high doses of alcohol. This resulted in a 2 X 3 mixed factorial design with sex of the bird and drinking condition as independent variables. After each drinking period the birds were individually tested in a large open field arena for five minutes. The behavior of the birds after consumption of the normal drinking water was considered baseline performance. Markings on the floor separated the arena into 15 sectors so that number of sectors entered and freezing time could be measured as dependent variables. In general, males were more active in the open field than females, even after consumption of normal drinking water, and alcohol affected the two sexes in opposite ways. Compared to baseline, males significantly reduced their ambulatory behavior after consuming the high dose of alcohol. Female ambulatory behavior was unaffected by consumption of either dose. The freezing time of the males increased significantly after consuming both the high and low doses. Unlike the males, the freezing time of the females significantly decreased after consumption of the low dose of alcohol. These findings suggest that the effects of alcohol consumption on the stress responses of Japanese quail is both dose dependent and sex specific.

110. Invasion patterns and ecosystem impacts of *Rhamnus davurica* (Dahurian buckthorn), *Daniel Walton, Biology*
Mentor: Anne Lubbers, Biology

Invasive plants can not only change the species composition of ecosystems but can also alter their physical properties. My study sought to investigate the ecosystem alterations of Dahurian buckthorn (*Rhamnus davurica*) in fields undergoing secondary succession at Blandy Experimental Farm near Boyce, VA. Three pairs of buckthorn plants and herbaceous vegetation plots were identified in three successional conditions, and several ecological measurements were made for each pair. Buckthorn was found to significantly lower soil CO₂ flux and moisture in comparison with herbaceous vegetation. Its leaf area index was also significantly higher than that of herbaceous plots. Higher leaf area index could lead to increased transpiration, reducing soil moisture and CO₂ flux under buckthorn and shading the soil to reduce temperature and rates of organic matter decomposition. Future studies might directly compare buckthorn to native woody shrubs or examine its effects in different climate conditions.

111. Extracellular DNA vs. extracellular DNase, *Brian Lim, Biology*

Mentor: Peggy Richey, Biology

Recent studies of 'extracellular traps' describe a novel role for extracellular DNA (exDNA) in mammalian defense against microbial pathogens by trapping and killing the invading microbes (Medina 2009; J. Innate Immunity 1: 176). Emerging data from the Hawes lab suggest for the first time that exDNA also is required for defense against microbial invasion of the plant root tip (Wen et al. 2009; Plant Physiology 151: 820). When plant exDNA is degraded by exogenous DNase, as in animal systems, resistance against pathogenic invasion is abolished. The goals of the current project are to assess the structure(s) of exDNA and the host specificity of the exDNA-exDNase interaction. Accomplishing the proposed experiments will help to establish a framework for defining conditions under which exDNA functions in plant defense, how commonly it plays a key role among diverse pathogen-host interactions, and at what level(s) of innate immunity this process operates.

112. The effect of pineal melatonin on locomotion and vocalization in the male zebra finch, *Taeniopygia guttata*,
Jennifer O'Brien

In avians, locomotion is regulated by the rhythmic release of pineal melatonin. Furthermore, avian vocalization also behaves in a rhythmic circadian cycle, and vocalizations can be differentiated into song and call components. To investigate the possible role of pineal melatonin in regulation of vocal behavior in comparison to locomotor activity, we simultaneously recorded the locomotion and vocalization in pinealectomized (PINX) and control (SHAM) adult male zebra finches. We found when introduced to constant darkness, SHAM birds expressed rhythmic activity, song and call, while all three behaviors of PINX birds gradually became arrhythmic at different rates. When rhythmic melatonin was introduced to the PINX birds, all three behaviors entrained at different rates. This suggests that both types of vocalization are regulated by the pineal melatonin, similar to locomotor activity. The different rates of entrainment in PINX birds suggest that the three behaviors may be controlled by separate, melatonin-regulated circadian systems.

113. Evaluation of Polyester 'Nanosponges' for Therapy with Emphasis on Tumor Cell and Vascular Targeting,
Aaron Edwards, Biology
Mentor: Steve Asmus, Biology

Targeted drug delivery systems are on the forefront of becoming a powerful anti-cancer clinical tool. Unlike other polymer-based delivery systems, previous studies with our current nanoparticle system show a sustained and controllable drug release profile. With targeting peptides attached to these nanoparticles, a means for direct and controlled delivery of chemotherapeutic agents becomes available.

We report the successful systematic preparation of a series of targeted, biodegradable nanoparticles in a variety of nanoscopic size dimensions using an intermolecular chain cross-linking reaction. These particles were then labeled with two fluorescent dyes to give a complete series of six particles.

To identify the most potent therapeutic nanocarrier, we sought to utilize the chorioallantoic membrane model as a preclinical evaluation tool, testing the targeting efficiency of the various carriers. Tumor growth delay studies using the particles in single and combination therapies with paclitaxel and camptothecin have shown superior effects in comparison to systemic chemotherapy.

114. Simplified IV Insulin Infusion Protocol for Glycemic Control in Critical Care, *David Carlson and Rodney Thompson, Pharm.D., Ph.D.; J. Timothy Sowell, Pharm.D.; Michael G. Carlson, M.D., Departments of Medicine and Pharmacy, Centennial Medical Center, Nashville, TN, USA*

Objective:

To evaluate the efficacy and safety of a simplified IV insulin infusion (IVII) protocol for glycemic control in critically ill patients in a nonteaching, community hospital.

Method:

Retrospective chart review of all ICU and CCU patients at Centennial Medical Center treated in 2009 with a modified IVII protocol. The IVII protocol consists of a table of insulin infusion rates (IIR) in 5 columns (A-E) for specified blood glucose (BG) ranges. IIR (units/h) were calculated using the formula: $IIR = (BG - 60) * ISF$, where BG is the midpoint of the specified glucose range and ISF represents insulin sensitivity factor (Columns A-E: 0.02, 0.03, 0.04, 0.06, 0.08). All patients start in Column B (unless otherwise specified by the ordering physician) and shifting between columns is specified according to subsequent BG response. Capillary BG is measured hourly. The specified BG target adapted from the 2006 ACE/ADA consensus guidelines is 80-120 mg/dL.

Conclusion:

The simplified IVII protocol described is safe and efficacious for achieving tight glucose control in hyperglycemic critically ill patients in a nonacademic community hospital setting. This IVII protocol does not require nurses to utilize complicated equations or rate of change calculations.

ABSTRACTS: JOHN C. YOUNG PRESENTATIONS

143. Impact Assessment in Microfinance, *Morgan Lynn*
Mentor: Lori Hartmann-Mahmud

The question of impact is central to the concept of microfinance. For non-profit, donor-funded organizations, donors want to know how their investment is affecting the lives of the women each project targets. For private microbanks on the road to becoming fully sustainable, impact assessment is crucial to improving operations in order to increase the bank's client body. The focus of this study is to determine best practices for assessing impact by striking a balance between quantitative and qualitative field methods. The sample Client Survey the study proposes is the product of extensive method research and intensive testing of the tool at the site of a microfinance project in a rural area of the Dominican Republic, which also serves as a case study for the thesis.

144. Parent-Offspring Kin Recognition in Japanese Quail: The Role of Parental Care, *Emily Gregory*
Mentor: Melissa Burns-Cusato

The present experiment was design to test whether parent-offspring recognition occurs in a species where little parental care is required for successful reproduction. Japanese quail chicks and parents were tested for this type of kin recognition three days after hatching. Genetic relatedness and social exposure prior to testing were manipulated across treatment groups. Although adult males showed no offspring recognition, the few female quail that displayed maternal behaviors showed a significant preference for unfamiliar chicks. Chicks that were naturally incubated spent significantly more time near an adult female than chicks that were artificially incubated. Chicks preferred their mother if she had displayed parental care. Thus, parental care may be necessary for kin recognition to occur. Daily injections of prolactin hormone, which correlates with incubation behavior, failed to induce parental care behavior. Future research will explore ways of inducing maternal care behaviors to determine the role of maternal care in parent-offspring recognition. Understanding the mechanism for parent-offspring kin recognition can aid in developing better captive breeding techniques for preserving endangered bird populations.

145. Microvessel regulation by tyrosine hydroxylase-immunoreactive interneurons in the developing rat and the adult human cerebral cortex, *Ben Cocanougher*
Mentor: Steve Asmus

The cerebral cortex is the most advanced portion of the brain and the hub of cognition. Within the cortical circuitry there exists a subset of interneurons that express tyrosine hydroxylase (TH), the first enzyme of the catecholaminergic pathway. These cells are enigmatic because they do not contain any subsequent enzymes of the catecholaminergic pathway, and therefore produce L-DOPA, the precursor to dopamine, as an endproduct. Part of the current study was conducted using developing rat cortex from postnatal age 16 days (P16), 20 days (P20), and 30 days (P30). Preliminary studies were performed using human tissue with moderate success. Immunohistochemistry and fluorescence microscopy were used to investigate the colocalization of TH-immunoreactive (TH-IR) interneurons with nitric oxide synthase (NOS), choline acetyltransferase (ChAT), and vasoactive intestinal peptide (VIP). Aquaporin 4 (AQP4) was used as a marker for brain vasculature. Cortical TH-IR and NOS-IR neurons were never colocalized. Half of the TH/ChAT-IR interneurons and half of the TH/VIP-IR interneurons observed were closely apposed to blood vessels. Our results suggest that at least some TH-IR neurons play a role in the regulation of cortical blood flow. Further characterization is warranted as TH-IR interneurons have been implicated in neurological disease.

146. From Page to Stage: Adapting Chuck Palahniuk's *Haunted*, *Sam Yates*
Mentor: Patrick Kagan-Moore

If you were offered three months away from the trappings of modern civilization – family, work, the internet, laws, religion – to write a masterpiece of your choosing, would you say yes? In this stage adaptation of Chuck Palahniuk's bestselling novel, *Haunted*, a group of social misfits answer an ad for a writer's retreat and unwittingly join a "Survivor"-like scenario where the host withholds communication with the outside world, heat and food. Trapped in an abandoned theater, the collected storytellers relay extreme tales borne from their troubled personal experiences. Becoming conscious that they have some power to craft their own tale – coined the "Mythology of Us" – the writers sabotage their situation in misguided attempts to become the star of a falsely anticipated media firestorm.

Join in a discussion on the process of deconstructing and reconstructing Palahniuk's vibrant source material for performance on stage, using twentieth-century playwright Bertolt Brecht's theories on aesthetics for "the epic theatre" as inspiration. Aiming to demonstrate the false-divide between Representational realism and metatheatrical Presentational drama, we'll examine the role of the "modern" actor, the audience's place in viewing drama, and the contemporary theatre's obligation to address current sociopolitical issues.

NB: Due the adult themes and strong language of the source material, this presentation may not be suitable for all audiences.

147. The "Petticoat Brigade" versus the "Iron-Jawed Angels": Using the Twentieth-Century American Woman Suffrage Campaign as a Model for American Socio-Political Movements, *Maria Kennedy*
Mentor: Brianna Leavitt-Alcantara

This project examines the tension between two significant American woman suffrage groups, the National American Woman Suffrage Association and the National Woman's Party, from 1913-1920. I will discuss several aspects that strained their relationship, including each group's interactions with President Woodrow Wilson as well as their contrasting methodologies and visions for American society. I will also address how these organizations' conflicts reflect divergent navigations of the early twentieth-century American gender system. The purpose of this comparative analysis of competing suffrage campaigns is to enhance our consideration of how socio-political movements operate and, ultimately, how socio-political change occurs in the United States. What risks and benefits do having two movements working towards the same goal bring to that objective? Do more radical factions inhibit the possibility of change or actually make it more feasible? What do we gain by evaluating individual organizations within socio-political movements instead of viewing campaigns holistically?

148. Perhaps in Lesbos': Lesbian Identity and Novelistic Production in Inter-War France and England, *Elisabeth Randall*
Mentor: Helen Emmitt

The purpose of this paper is to situate Radclyffe Hall's novel *The Well of Loneliness* (1928) within the context of lesbian literary modernism. Although *The Well* played a critical role in the development of modern Western lesbian identity, its place within the lesbian literary canon has been controversial. For many scholars, Hall's ideological and literary conservatism represents a failure to be truly 'lesbian,' a category which is characterized, especially at this time, by a fluid, fractured modernist self constructed within a reverse discourse. Those attempting to reclaim *The Well* as "lesbian" generally emphasize Hall's conformity to this definition. However, I argue that Hall intentionally rejects the modernist model of selfhood because her goal is to achieve a holistic self contained within the mainstream discourse of identity. I read *The Well* to examine how Hall constructs Stephen Gordon, her protagonist, as both a lesbian and a literary artist whose unified sense of self and need for normality makes a modernist identity intolerable. Importantly, however, the project of *The Well* is not limited to an expression of frustration and despair. Hall's project here is significantly more complex, as the narrative itself is intended to create greater acceptance of lesbian identity, propelling it into the mainstream discourse.

149. Livin' the Dream: Nashville Songwriter Culture in Film, *Rachel Skaggs*
Mentor: Beau Weston

At any given time there are thousands of songwriters in Nashville vying for a song on the Top 40 charts. The Nashville music business is known worldwide as the place to go to break into the country music industry, and though it is easy to imagine that music artists and groups have an uncertain and competitive road to success, the songwriters who craft country music have separate and equally challenging obstacles to success. Through interviewing songwriters, studio musicians, producers, industry executives, and entertainment attorneys, I attempt to capture the culture and occupational evolution of Nashville songwriters in documentary-style vignettes. The uncertain nature of the music business leads to rich material about this group whose sole occupation is creating a part of American popular culture.

NAME INDEX

(The number represents the page number for the author or faculty mentor)

- Adams, T., 11, 33
 Agnew, S., 4, 15
 Akin, L., 8, 29
 Albertine, S., 10, 32
 Anderson, B., 8, 26
 Anderson, D., 5, 19
 Anton, M., 30
 Apple, C., 5, 10, 19, 32
 Asmus, S., 15, 39, 40
 Asmuth, J., 31, 35, 36
 Atkins, J., 27
 Augustus, A., 9, 31
 Barton, C., 33, 37
 Basconi, R., 8, 27
 Baumgartner, E., 5, 13, 18
 Baumgartner, K., 7, 24
 Baxter, R., 13
 Beer, K., 8, 26
 Bell, K., 10, 13, 32
 Bentley, M., 5, 19
 Binder, K., 11, 34
 Bishop, D., 4, 17
 Bitensky, L., 6, 23
 Blair, J., 7, 26
 Blank, R., 7, 26
 Bohnert, J., 9, 31
 Boll, R., 4, 15
 Boone, B., 4, 16
 Boone, J., 13
 Botts, H., 5, 21
 Bouvier, F., 23
 Boyer, E., 9, 31
 Brown, W., 11, 33
 Buckhout, J., 4, 15
 Burns-Cusato, M., 0, 2, 20, 21, 25, 28, 40
 Burton, P., 4, 7, 15, 24
 Cadavid, E., 16
 Cao, S., 11, 35
 Carbone, C., 18
 Carlson, D., 12, 39
 Carlson, M., 12, 39
 Carson, B., 7, 23
 Childress, T., 11, 34
 Clark, L., 8, 29
 Clay, L., 13
 Cocanougher, B., 14, 40
 Corrigan, B., 5, 22
 Curlis, L., 2
 Curry, R., 8, 30
 Cusato, B., 8, 20, 28, 38
 Czubak, J., 5, 19
 Davis, J., 5, 21, 22
 Denney, C., 13
 Dew, S., 4, 16
 Diemer, M., 11, 34
 Dilisio, M., 11, 34
 Donald, Jr, C., 10, 32
 Dorsch, A., 7, 23
 Dyche, K., 7, 25
 Edwards, A., 12, 39
 Edwards, J., 5, 7, 20, 24
 Ellis, J., 11, 35
 Emmitt, H., 41
 Evans, C., 5, 22
 Everett, L., 13
 Fabritius, S., 2
 Faul, M., 11, 36
 Fenwick, E., 11, 34
 Fieberg, J., 5, 21, 35
 Finney, B., 10, 23, 32
 Forte, K., 11, 33
 George, W., 8, 29
 Gesser, J., 5, 20
 Gralheer, L., 5, 21
 Greene, J., 10, 32
 Greer, H., 5, 21
 Gregory, E., 5, 8, 14, 20, 28, 40
 Griffith, J., 13
 Grigoryan, J., 4, 15
 Gunn, B., 8, 30
 Haigh, A., 33
 Haile, J., 16, 33, 36
 Hall, A., 10, 32
 Hall, D., 7, 25
 Hallock, M., 10, 32
 Hamilton, M., 31
 Hansen, L., 6, 22
 Hartmann-Mahmud, L., 28, 40
 Hawthorne, M., 11, 33
 Hench, L., 4, 15
 Herde, A., 13
 Herren, K., 11, 34
 Hochstetler, T., 11, 36
 Hodge, B., 4, 8, 16, 29, 30
 Hogancamp, E., 7, 11, 24, 35
 Hoglen, J., 4, 18
 Horton-Thomas, Z., 13
 Howell, S., 11, 35
 Huff, A., 5, 20
 Hume, B., 5, 21
 Humphries, S., 11, 34
 Hupman, A., 8, 28
 Jackson, K., 4, 13, 18
 Jadoon, I., 8, 30
 James, J., 27
 Jarman, S., 2
 Jefferson, L., 25
 Johnson, B., 19, 20, 34, 35
 Joines, J., 4, 15
 Kaeser, J., 11, 37
 Kagan-Moore, P., 40
 Kalb, J., 10, 32
 Kalugyer, J., 11, 34
 Keffer, K., 4, 17, 18, 22
 Kelly, J., 31
 Kennedy, M., 14, 41
 Kirchner, D., 4, 17
 Klooster, M., 17
 Knoll, B., 4, 15
 Krier, J., 11, 33
 Leak, III, J.T., 8, 27
 Leavitt-Alcantara, B., 24, 41
 Lee, S., 5, 20
 Lentz, K., 11, 33
 Leonardi, G., 4, 15
 Lightfoot, M., 8, 29
 Lim, B., 12, 38
 Link, N., 10, 32
 Liu, S., 13
 Lowe, P., 2
 Lubbers, A., 37, 38
 Lynch, K., 11, 36
 Lynn, M., 14, 40
 Maddox, J., 13
 Manheim, D., 5, 18, 19
 Mannon, C., 5, 22
 Martin, A., 13
 Mashburn, L., 4, 17
 Mayfield, M., 11, 34
 Mayho, A., 6, 22
 McClain, R., 11, 38
 McCollough, T., 25
 McCollum, L., 11, 37
 McGuire, C., 13
 Meiler, J., 8, 29
 Melloan, J., 9, 31
 Mendoza-Forrest, S., 25
 Miles, P., 21
 Miller, C., 5, 18
 Miller, M., 7, 26
 Mishu, S., 7, 25
 Montejos, K., 8, 28
 Montgomery, E., 5, 22
 Morgan, S., 8, 28
 Morris, C., 8, 13, 28
 Mothion, P., 7, 18, 22, 26
 Murray, S., 33, 34, 36, 37
 Muzyka, J., 8, 29, 35
 Neiser, J., 9, 31
 Nesbitt, P., 5, 19
 Noltemeyer, P., 30
 O'Brien, J., 12, 38
 Oberst, L., 5, 21
 Paskewich, C., 15
 Passariello, P., 8, 26, 27
 Paumi, K., 29, 30, 35
 Penn, K., 8, 28
 Perry, J., 0, 2
 Petkus, M., 8, 22, 27, 28
 Podapati, P., 11, 37
 Polio, W., 5, 11, 21, 35
 Pope, N., 4, 15
 Powell, J., 2
 Randall, E., 14, 41
 Ransdell, J., 7, 25
 Rehkamp, B., 13
 Richey, P., 7, 24, 38
 Roberts, K., 8, 27
 Roessler, A., 7, 25
 Ronald, S., 11, 36
 Sar, K., 4, 16
 Schagene, A., 4, 15
 Schneiders, K., 4, 17
 Sears, W., 11, 33
 Selvy, D., 5, 19
 Semedo, L., 13
 Shewmaker, J., 11, 33
 Shirley, E., 8, 30
 Short, M., 10, 32
 Simon, T., 4, 18
 Skaggs, R., 14, 41
 Skees, A., 7, 26
 Skogsberg, K., 29
 Sliney, E., 13
 Slone, B., 5, 11, 21, 35
 Sowell, J., 12, 39
 Springate, J., 11, 33
 Stanley, C., 8, 27
 Stephens, C., 8, 30
 Storz, B., 5, 20, 34, 36
 Stroup, D., 7, 23, 24
 Sweeney, Z., 8, 29
 Sweitzer, M., 13
 Tamagawa, Y., 6, 23
 Taylor, H., 13
 Thompson, E., 13
 Thompson, R., 12, 39
 Trollinger, M., 13
 Vincent, C., 11, 34
 Walls, H., 4, 7, 16, 24
 Walton, D., 10, 12, 32, 38
 Webb, N., 11, 34
 Weiner, B., 8, 29
 Wentz, C., 2
 Werner, B., 30
 West, C., 11, 36
 Weston, B., 41
 Wilkinson, T., 13
 Will, R., 5, 8, 20, 28
 Williams, M., 8, 29
 Wilson, J., 8, 30, 36
 Wilson, S., 11, 33, 34
 Winningham, D., 13
 Winter, J., 13
 Woehrl, A., 4, 17
 Workman, J., 22
 Worley, D., 32
 Wu, Y., 8, 27
 Wyatt, C., 6, 10, 15, 23, 32
 Yang, J., 9, 31
 Yates, S., 14, 40
 Young, J., 11, 37
 Zhou, Y., 13